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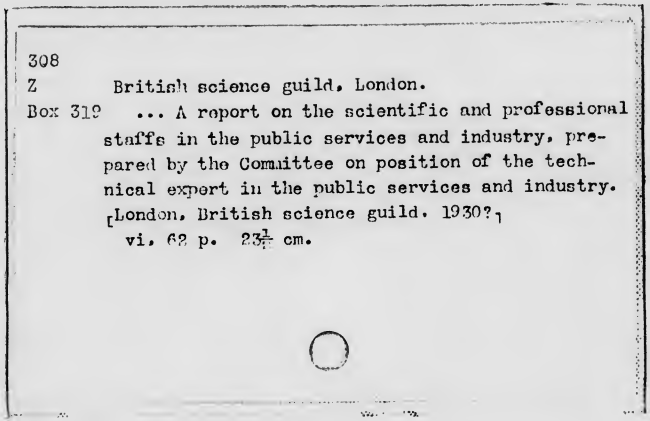

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REPORT

ON

THE SCIENTIFIC AND PROFESSIONAL STAFFS IN THE PUBLIC SERVICES AND INDUSTRY

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BRITISH SCIENCE GUILD

A REPORT

ON THE

SCIENTIFIC AND PROFESSIONAL STAFFS IN THE PUBLIC SERVICES AND INDUSTRY

PREPARED BY THE

COMMITTEE ON THE POSITION OF THE TECHNICAL EXPERT IN THE PUBLIC SERVICES AND INDUSTRY

Mar. 30, 1931 DA/Hee

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BRITISH SCIENCE GUILD.

The Scientific and Professional Staffs in the Public Services and Industry.

INTRODUCTION.

a. TERMS OF REFERENCE.

1. The Committee was appointed by the British Science Guild on November 17th, 1927. Unfortunately Professor Arthur Smithells, C.M.G., F.R.S., who had accepted the Chairmanship, was later compelled to resign this position owing to ill-health. In consequence the Committee was re-constituted under the Chairmanship of Sir Richard Redmayne, K.C.B. The terms of reference are:—

> "To inquire into the functions of the scientific and professional staffs in the Public Services and Industry from the point of view of efficient administration and national development, and to report thereon."

b. ARRANGEMENT OF THE REPORT.

A summary has been prepared giving a general idea of the scope of the main report. For general convenience, the Summary and the main report are published together under the same cover; the former bears the designation Part I, and the latter Part II.

PART I.

SUMMARY OF REPORT.

A. INTRODUCTORY REMARKS.

The report explains in its opening paragraphs that the present position of those with scientific and professional qualifications engaged in the Public Service and in Industry, as outlined therein, is based upon information from a number of different sources; (1) as regards the National Civil Service, such vocational associations as the Institution of Professional Civil Servants; (2) as regards the Local Government Service, from the Proceedings of such bodies as the Society of Medical Officers of Health and the Institution of Municipal and County Engineers, as well as from evidence given before the Royal Commission on Local Government appointed in 1923; and (3) as regards Industry, from individual inquiries. In the last

instance, although the attitude of the professional institutions was sympathetic, the information desired for the purposes of the inquiry was not available, and the institutions themselves did not possess the necessary organisation for investigating the matter.

The report proceeds with the statement that the aim has been solely to improve efficiency in the Public Service and in Industry, the inquiry having had no concern whatever with salaries or wages, or with amelioration of the conditions of work.

The principles to be observed in order to secure administrative efficiency are then discussed. It is maintained that human beings cannot readily be classified as suitable for a particular kind of work and that kind alone. Some scientists have made good administrators, and many administrators, given the necessary training, might well make good scientists; the best result is not to be obtained by the creation, so to speak, of water-tight compartments. The report then expresses the view that Industry is beginning to recognise this fact, for the control of industrial enterprises is steadily becoming more and more a matter of collaboration between men of financial and commercial experience and men of scientific attainments, as opposed to absolute control, as formerly, by those experienced in finance and commerce only. On the other hand, the public services as a whole have not hitherto recognised this truth to anything like the same extent, though the requirements of efficiency in the Public Service do not differ in essentials from the requirements of efficiency in Industry.

B. SYSTEMS OF ORGANISATION.

The report passes on to a discussion of systems of organisation. In general, systems of administration are of two kinds. In the first control is exercised by a single individual who is normally responsible for all decisions on matters of policy. A general in charge of an army on campaign is possibly the best clear-cut example of this method of control. In the second, control is exercised by a group of individuals who act together with a joint and several responsibility. The two systems are frequently referred to as the bureaucratic system, an expression which implies control by a graduated series of officials responsible only to a departmental head, and the collegial system, implying control by a group or committee. In the realm of Central Government the first system is commonly preferred, though the services organised for the defence of the country, namely, the Board of Admiralty, the Army Council, and the Air Council, offer examples of the alternative collegial system. In the realm of Local Government the collegial system definitely prevails, the County or Town Council acting through its various committees. In this system it is in general necessary for a public official to have every decision on a matter of policy made or confirmed by a committee of the Council before it can

legally be acted upon. In the realm of Industry, though the collegial system nominally prevails, in that any decision on a matter of policy is made by a Board of Directors, in practice a Managing Director or General Manager often acquires a degree of latitude approaching that of a General in command of an army, or a departmental head in the Government Service. To sum up briefly, both systems of administration are represented in the Central Government; in Local Government the collegial system prevails, modified by the degree of latitude allowed to individual officials; in Industry, on the other hand, whilst normally the collegial system prevails, in practice the theoretical advantages of the bureaucratic system—rapidity of decision, a well considered and uniform line of policy continuously applied, and direct personal responsibility—are, in greater or less measure, attained.

The report proceeds to discuss the further sub-division of systems of organisation into a territorial type and a functional type. In the former an official is placed in charge of a district forming part of an administrative area, being held responsible for all services or works in that district, each district forming in itself what may be termed a unit of organisation. This type of organisation bears some relationship to the bureaucratic type of administration referred to above. The functional type on the other hand has regard to the service to be given over the area as a whole, control of the duties being allocated to properly trained officials at headquarters each in charge of a section of the work, with assistants under them who may be at headquarters or resident in the area. In practice this last has something in common with the collegial type of administration. In such an organisation the heads of sections may be regarded as being individually and jointly responsible to the head of a Government department or to a Managing Director or a Board of Directors in industry. The opinion is expressed in the Report that whether the ultimate control is in the hands of an individual or a board the functional type of organisation is superior to the territorial type. The reasons for this preference are given in full in Appendix III.

C. THE SPHERE OF LOCAL GOVERNMENT.

The report passes on to a consideration of the position of scientific and professional men in the Local Government Service. The conclusion reached is that the technical knowledge and training of the scientific and technical staffs is, on the whole, properly utilised and appreciated by County Councils and municipal bodies. The broad conclusion reached is expressed by the following extract from the report (Paragraph 42):

> "The directive and administrative structures, which have "stood the trial of many decades, are both suitably designed to "secure the highest degree of efficiency and economy in the local "government services. There may be minor directions in which "improvements could with advantage be effected, but radical

''alterations such as those which have been advocated by some of ''the witnesses appearing before the Royal Commission on Local ''Government, in the type of administration or in the staff organ- ''isation in vogue at the present time for the purposes of the manage- ''ment and execution of the local government services, are to be ''strongly deprecated: innovations which would transform the ''structure of municipal government in order that it should possess ''a close resemblance to the model of a civil department of the ''Central Government would, we are of opinion, prove injurious to ''the interests of the rate-paying public.''

D. THE CIVIL SERVICE.

The next succeeding section of the report discusses the position of those holding professional and technical qualifications in the Civil Service. A very brief historical review is first given, the interesting fact being mentioned that during the XVIIIth century the ordinary civil administration was carried on by Ministers of the Crown themselves with the help of personally appointed clerks. Later, the industrial revolution of the early XIXth century brought so many new problems that a class of permanent government officials gradually came into being. From these beginnings gradually evolved the Civil Service organisation as we now know it.

At first administrative problems predominated, and the men appointed to fill the administrative posts which developed or were created were necessarily men entirely without scientific training,—necesssarily because systematic courses of training in scientific subjects hardly existed at that time. The system of competitive examination was introduced later and it soon became established that a career on the administrative side in the Civil Service was the exclusive privilege of those who had entered the Civil Service by what came to be known as the Higher Division Open Competitive Examination. Meanwhile the responsibility of the State in relation to the complex problems of an industrialised community was constantly expanding, so that from the beginning of the present century the number of men with scientific training and technical experience in the Government service began rapidly to increase. The competitive system was, however, never completely applied to the technical and scientific recruits who were appointed from time to time. This situation held until the time of the Great War, immediately following the termination of which the Civil Service on its administrative side was thoroughly re-organised on lines recommended by the Joint Committee of the Civil Service National Whitley Council which reported in 1920. Under this re-organisation provision was made for opening the higher administrative posts to all men and women, already in the service, who show proof of ability. A proportion of these posts was to be filled in future by men selected for appointment to the Public Service by means of open competitive exam-

ination ''in the subjects embraced by the various honours courses of University institutions.'' Thus for the first time it seemed possible to anticipate the appointment of at least a proportion of men and women with scientific training to posts which may ultimately lead to the permanent headship of a principal department of State.

The report proceeds to discuss in considerable detail the practice at present in vogue in relation to the conduct of work and Civil Servants with professional and scientific qualifications. As this is a direction in which a definite lack of efficiency is alleged against the Civil Service, the report may be allowed to speak for itself:

''The affairs of State are conducted on a highly centralised ''system, which entails a considerable volume of correspondence ''between the secretary's department and the technical and other ''departments of the same Ministry; the volume of this correspon- ''dence is, in some Ministries, so great that the permanent adminis- ''trative chief can deal only with a small fraction of it, and, con- ''sequently, the major part of it passes into the hands of various ''grades of administrative and clerical officers in the secretary's ''department, who prepare a summarised minute thereon for the ''information of the Minister. In other words, in the normal ''course of events unless the expert has the privilege of direct ''access to the Minister by virtue of special circumstances, such as ''personal acquaintance, all his plans, ideas and activities in ''connection with matters coming within his purview are subject ''to filtration and interpretation by an officer or officers who must, ''in the nature of things, be less competent to appreciate their ''significance. Not only is this practice detrimental to the status ''of professional, scientific and technical officers, but also it deprives ''the supreme departmental authority of direct contact with the ''technical expert upon whose advice his decision should depend, ''and often results in providing him only with a layman's inter- ''pretation of the technical expert's advice.''

The report supports the view that serious inefficiency arises where the practice in vogue for dealing with matters of a technical character is normally as described above. It expresses the further opinion that a defect exists in the Civil Service staff organisation because of the practice which has hitherto been followed of excluding officers of the expert class from the important administrative posts responsible for the direction of the work. Such posts are almost invariably filled by promotion from the administrative and clerical staffs. The practice of the Central Government is contrasted with that of Local Government bodies, greatly to the disadvantage of the former. At the same time the reasons why the difference has come to exist are given, the main reason being the gradual evolution of the Civil Service out of the Central Government. The matter is finally summed up in these words:

''In view of the fact that administrative ability of the first ''rank is uncommon, the policy which prevails in the Civil Service ''in relation to this matter has been characterised as being 'in-

''expedient, short-sighted and unjust.' Although no purely ''administrative officer can, except in rare circumstances, be ''included in the technical or scientific staffs, on the other hand ''the work of many technical and scientific officers is partly adminis-''trative in character and, in the interests of national and industrial ''efficiency, it is essential that a technical or scientific officer ''possessing proved administrative ability should not be excluded ''from the administrative side of the staff organisation.''

The report next refers to the Report of the Research Co-ordination Sub-Committee of the Committee of Civil Research. This report contains a descriptive account of the development and present organisation of the scientific, research and experimental activities of the State, which account is held to be accurate except as regards certain departments of the Admiralty and the Air Force. The present organisation of the Department of Scientific and Industrial Research is said to be satisfactory, as also is the Scientific Research and Experiment Department of the Admiralty. The Air Force activities of a similar kind are conducted by means of what is known as the Joint Directorate of Scientific Research and Technical Development. The present report holds this organisation to be unsatisfactory for reasons of dual control and dual responsibility. The argument is given at length in paragraphs 61, 80 and 81, and in paragraph 64 some suggestions, ''tentative at the present stage,'' are put forward for its solution.

The Royal Commission appointed by the present Prime Minister to inquire into the structure and organisation of the Civil Service is next referred to. The report urges the need for a simplification and grading of the professional, scientific and technical staffs in the Civil Service, and expresses the view that ''drastic reforms are needed in many of the civil departments of the Government'' on the general lines already indicated. Finally an extension of the collegial type of organisation already existing in the Board of Admiralty, the Army Council and the Air Council, is recommended for the Civil Service generally in place of the existing bureaucratic system. In the latter system something differing very little in practice from autocratic control is exercised, whereas under the collegial system all important interests and all important aspects of a case can be represented and receive due weight before a decision is made.

E. THE DEFENCE DEPARTMENTS.

The report passes on to a consideration of the organisation of the Defence Departments. The three departments of defence—naval, military and air force—are concerned not only with the armed forces of the Crown, but are responsible also for much important research and experimental work of a scientific kind, and for educational establishments in which specialised instruction and training are provided. Each department has a number of Advisory Committees the membership of

which includes many civilians who are distinguished men of science. In the report the view is expressed that hitherto the arrangements which exist for the maintenance of close contact between the Advisory Committees on the one hand and the officers of the fighting services on the other are in need of overhaul and improvement. The general aim should be to bring more completely to the notice of the officers of the fighting forces the work of the Advisory Committees, so that naval, military and air-force officers may enunciate their more difficult problems, and so that the Committees may indicate the directions in which science could assist towards the solution of their difficulties.

F. THE NAVY.

Taking the Navy, Army and Air Force in sequence, the report goes on to discuss the organisation of their technical departments. It is pointed out that the mechanisation of the Navy dates from the 1850's, and that ever since that time Naval Engineer Officers have been engaged in a long struggle the outcome of which, long doubtful, has not yet completely appeared. Certain technical officers, the ship construction and electrical branches, have always been governed by Civil Service Regulations, and the Engineer Officers themselves, like the Medical Officers, were at one time included in a Civil Branch.

Improved status for Medical Officers and Engineers was reached by a slow process of evolution, with the very natural result that the recruitment of both services was for a long period far from satisfactory. The Fisher-Selborne Scheme of 1902 contained elements which promised the solution of a number of difficulties, and slow but steady progress was still being made when, in January 1915, during the Great War, Engineer Officers were granted full military rank and status in recognition of their outstanding services.

This happy state of affairs did not, however, last long. The conditions of service for engineers were subsequently changed from time to time until, in November 1925, a new Fleet Order deprived Engineer Officers of their comparatively new-found rank and status altogether, and with it many of the advantages which rank and status confer. This situation holds at the present time. After a lengthy discussion of the position the conclusion is expressed that Engineer Officers must be given higher status than they now possess if men of good qualifications are to be attracted to the service in adequate numbers.

Finally, the report quotes with approval the recommendations of a Joint Committee of six professional bodies (namely, the Institutions of Civil Engineers, Mechanical Engineers, Naval Architects, and Electrical Engineers, the North-East Coast Institution of Engineers and Shipbuilders, and the Institute of Marine Engineers) broadly in line with the views outlined above and requesting that the Engineer Branch be given direct representation on the Board of Admiralty, with control

of all technical work. In conclusion, the view is expressed that a settlement on the lines indicated would promote both efficiency and harmony.

G. THE ARMY.

As regards the Army, it is recalled that at one time the control of the Scientific Corps, the Artillery and the Engineers, was in the hands of the Board of Ordnance, which was quite independent of the Commander-in-Chief or even of the Secretary at War. This ceased, however, in 1855, when the Artillery and the Engineers, like all other arms of the service, were placed nominally under a Commander-in-Chief. This organisation remained in principle the same until, as a result of experience during the Boer War (1899-1902), the post of Commander-in-Chief was abolished and the Army Council came into being. From about the time of the establishment of the Army Council the rapid advance of technical knowledge greatly increased the importance of the Scientific Corps, and as a result of the Great War new arms whose duties are largely of a technical kind, such as the Royal Corps of Signals and the Royal Tank Corps, were established as independent units. There has since been a growing tendency right up to the present time for the Army to share the growing mechanisation of civil life, so that the scientific and technical officer has acquired increased importance, an importance which on the whole has been adequately recognised. As a final conclusion on Army administration, the report expresses the view that the importance of scientific and technical work is now adequately recognised by the Army Council and that technical officers of military status enjoy a high prestige in consequence.

H. THE AIR FORCE.

The Air Force came into existence during the Great War. It is administered by an Air Council similar in type to the Army Council. The Secretary of State for Air is President of the Council, which consists of 5 members, three of whom are Officers of the Air Force, and a Secretary who is a Civil Servant. There is now direct entry into the Air Force, officers being recruited by open competition for entry to the Air Force Cadet College at Cranwell, but a large number of the officers employed on scientific and technical work are civilians under the Civil Service Regulations. There is obviously a need for effective *liaison* between the Air Force officers and the civilian staff, but the report records that this aspect of Air Force administration has not yet received adequate attention at the Air Ministry. The Report concludes that at the present stage of development the civilian technical expert is indispensable, and it therefore recommends that questions affecting the status and promotion of the fighting personnel and of the civilian administrative and technical staffs should be kept separate from each other, the idea being to provide careers on parallel lines in two separate organisations, each organisation having its separate list for promotion, and each bringing its specialised knowledge and experience to the service of the Air Council.

I. THE SPHERE OF INDUSTRY.

As regards Industry, the report holds that technical considerations have too often been over-ridden by financial and other considerations in many industries, and cites "the high *average* modernity of industrial plants in America, Germany and France and the number of relatively obsolete plants in this country" in support of this view. In the comparatively new fields of motor vehicles and aircraft production, in the manufacture of synthetic products and in that of artificial silk, it is argued that the excellent results attained are due to the quick application of scientific discoveries and technical experiments to commercial practice, due mainly to a much closer degree of co-operation than has hitherto been usual between administrators and commercial directors, on the one hand, and those responsible for initiating and conducting research on the other. Pressure of events is compelling a change of outlook in a number of industries, most of all in the depressed staple industries, in which indeed it is held that the need for comprehensive re-organisation, mechanical re-equipment, and far-reaching changes in productive methods, is most urgent.

In concerns in which the method of closer co-operation has established itself, each Board of Directors has become a body of persons selected by reason of the possession of particular qualifications, so that collectively the Board combines a knowledge of administrative problems with that of the trend of scientific and technical developments. It is thus able to make wise and far-seeing decisions on questions of general policy. The importance of this development from the point of view of the present inquiry is that technical officers and directors of research obtain due recognition, with the result that up-to-date methods are adopted and the technical officers themselves rapidly secure a status in the undertaking commensurate with their contribution to its efficiency and commercial success.

This section concludes with the statement that the efficiency of industry under post-war conditions may well be most rapidly and effectively improved along the general lines just indicated.

The report finally sums up the situation in these words:

> "Were the fact to be fully recognised and admitted that in "modern business and governmental organisations the closest "co-operation is required on the part of those responsible for the "financial, administrative, commercial, scientific and technical "aspects of the work therein, the difficult problems of administra- "tion and organisation would more easily be solved; the knowledge "that all were agreed that efficiency in a complex organisation "depends upon a contribution different in kind, if not in degree, "from every group therein, would prove to be the readiest means "of securing contentment among all classes of workers."

PART II.

THE REPORT.

I—GENERAL SURVEY.

a. Preliminary observations.

1. It is to-day possible to gauge with a considerable degree of accuracy the situation, as it affects the man of science and the technologist in the Public Service, owing to the existence therein of specialised vocational associations, such as the Society of Post Office Engineers, the Patent Office Examining Staff Association and the National Physical Laboratory Scientific Staff Association, which, with other similarly constituted societies, are constituents of the Institution of Professional Civil Servants, and the Society of Medical Officers of Health, the Institution of Municipal and County Engineers, and the National Association of Local Government Officers. A large number of these societies have been formed within comparatively recent years for the purpose of protecting and furthering the interests of the professional and technical staffs employed in Government Departments and under the Local Authorities. Practically all such associations periodically issue publications dealing with their activities and thereby give an insight into the nature of the problems to which attention has been devoted by their managing bodies. Furthermore, the Royal Commission on Local Government appointed on February 14th, 1923, under the Chairmanship of Lord Onslow, took evidence during the first three months of 1929 from some of these vocational associations (a list of them is given in Appendix I), particularly in relation to the duties and status of the professional and technical officers employed under the Local Authorities.

2. In these circumstances it is thought that, so far as the Local Government Service is concerned, the situation can best be described by a summary of the evidence tendered to the Royal Commission on Local Government already referred to, and this course has accordingly been adopted. In this evidence the practice of the Central Government in relation to the national Civil Service has been touched upon and its attitude towards its technical officers has been contrasted with that of the Local Authorities towards their chief officers, who are engaged mainly on technical duties. This matter is dealt with later; however, in view of the great importance of the subject, steps were taken to obtain further information with regard to the situation in the Civil Service from the Institution of Professional Civil Servants, and the particulars so obtained are also summarised in a subsequent part of this report.

3. The important professional institutions associated with Industry were also approached on the subject. A sympathetic attitude was shewn by them, and in certain cases assistance has been given, with the object of furnishing the Committee with information. However, these professional institutions do not possess the machinery for carrying out exhaustive inquiries upon matters in regard to which the Committee was seeking particulars. In these circumstances the difficulties of obtaining generalised information relating to the responsibilities and status of those engaged on the technical side of industrial and commercial undertakings have been considerable. In view of the importance of the subject it was decided to address individual inquiries to a number of persons engaged on technical duties in some of our important industries; the information so obtained is embodied in this report.

4. It should be clearly understood that any criticisms of the present system contained in the subsequent paragraphs of this report, and any of the changes in the relations of the administrative and scientific sides proposed therein, are devised not for the amelioration of the conditions of the scientific and technical officials but solely as a means for securing the highest degree of efficiency, whether in the Public Service or in Industry.

b. Scientific and technical character of many modern problems.

5. Not only in Industry, but also in the national Civil Service and the Local Government Service, much of the work dealt with to-day involves the consideration of matters which are of a highly scientific and technical character. Such work in nearly every case has an administrative and a technical side; it must be based upon accurate and complete knowledge of the problem under consideration, and this problem must be pronounced upon after careful study of financial means and with due regard to its bearing on other collateral problems. Evidently here there is need of close collaboration in the initiation of schemes and policies and of their subsequent execution on the part of the scientist or the technologist, the financial adviser and the administrative chief.

6. The general principles which must necessarily be applied both in Industry and in the Public Service, if the best results are to be secured, are identical. In each case it is essential that all proposals and schemes shall receive adequate consideration from every point of view. This end can be obtained only if suitable provision is made for the proper presentation of the various technical, financial and other considerations involved in every problem, in such a manner that those ultimately responsible for making decisions may be put in a position to weigh the several considerations in their bearing upon questions of general policy.

7. From the information obtained by the Committee, it is evident that neither in Industry nor in the Public Service are the foregoing requirements met in every case. It is most desirable, therefore, that

those responsible for the organisations existing in industrial enterprises and in the several branches and departments of the Public Service should thoroughly overhaul these, with a view to remodelling and modernising them where necessary, so that in each case the organisation adopted should be such as to comply with the general principles enumerated above.

8. It is sometimes asserted that the administrative and technical aspects of problems which have to be dealt with in important technical enterprises are entirely separable and distinct, and are so very different in their character that each aspect must be dealt with in a separate compartment of an organisation, on the assumption that quite different types of mind are required to deal efficiently with each of these aspects, the administrative and the technical, of industrial problems. If this were so, logically, according to the foregoing view, those whose temperament, training and experience are of an administrative order would be no more competent to give decisions in relation to matters in which complex technical considerations were involved than would be those whose temperament, training and experience are of a technical order to deal with the administrative aspects of such problems. The situation then in relation to all problems into which scientific and technical considerations entered would be most unfortunate; in such circumstances all important decisions would necessarily have to be arbitrary.

9. But experience in all parts of the world shews that human beings cannot be classified as belonging distinctly to one or the other only of these two categories. It is true, of course, that some persons who have not received a scientific training or have had no technical training, experience very considerable difficulty in getting even a small grasp of the scientific and technical aspects of complex problems; but the number of such persons is proportionately small. On the other hand, there are persons with high scientific attainments, who have had considerable technical experience, to whom the administrative details connected with their work prove irksome; persons with a temperament of this kind will not willingly in consequence undertake work of which the major part consists of attention to the administrative aspects of the problems that have to be dealt with. But there are very large numbers of men possessing ample scientific knowledge and wide technical experience who take considerable interest in, and have knowledge and experience of, the administrative side of the work upon which they are engaged. Were this not the case, it would be urgently necessary to take special steps to deal with the situation with a view to remedying what would be a serious defect in the training of the technical man, for it has to be borne in mind that to-day there exist industrial enterprises in which the duties not only of the chiefs but also of the supervising staffs, and even of the skilled workmen, involve not merely the carrying out of work of a purely technical kind, but, further, demand

attention to administrative details varying in measure according to the grade of the employee in the organisation.

c. The technical expert and the management problem.

10. It seems desirable to make some reference here to the arguments which are sometimes advanced against the appointment of men of science and technologists to important administrative posts, in order that it may not be erroneously assumed either that an important issue is being shirked or that such arguments cannot be effectively countered.

11. Various reasons have been put forward from time to time for the preference shewn in this country for the selection of men without technical qualifications for the most important administrative and commercial positions in an organisation. It has been asserted, for instance, that men with high technical qualifications have, as a rule, so strong a bias that they cannot adjudge correctly between competing schemes to secure a definite end, and attention is called to the fact that technical men sometimes differ in their opinions in relation to the best way in which some particular problem should be settled. Those who advance this view overlook the fact that it is usually only when something entirely new in the technical field first puts in an appearance that the opinions of technical men differ as to the methods to be adopted in utilising the new discovery or invention. Such differences are not due, as is assumed, to personal prejudice or bias, but to the fact that when it becomes a question of making practical application of a new discovery or invention in its pioneer stage, it is necessary to ascertain the advantages or disadvantages of one arrangement or another by actual experience; and further, it is only by testing such discoveries or inventions, sometimes over a long period of years, that their value can be definitely and accurately ascertained. This information, it is evident, is of paramount importance when dealing with competing schemes and cannot be obtained by something in the nature of instinct by either the non-technical administrator or the man of science or the technologist.

12. It has been further suggested that the technical expert has a tendency to ignore the human element in a situation and frequently shews an inability to discuss and negotiate, compromise and come to terms with people because he thinks of nothing other than the functional results of his work. Actual experience completely contradicts the foregoing suggestion. In planning his projects, the technical expert has continually to bear in mind the capacity of those who will be called upon to give practical shape to the various parts of his scheme so as to produce results which will be satisfactory in the completed whole, and he does—and of necessity, must—often discuss matters of a technical and also administrative kind with superiors and subordinates, and soon learns the value of compromise (which is almost another word for co-ordination), and accommodation, i.e., the exclusion of non-essentials.

He early obtains experience of a kind which is important for any would-be administrator. It is of course true that he looks very carefully at the functional results of his work, for no one can realise better than he the measure of the financial loss and, frequently, the risk to human life which may result from ignoring certain elements to which he has to pay due regard when preparing his plans.

13. Considerable changes have for many years now been taking place in the character of industrial undertakings. Enterprises of this kind owned and managed by a person with technical knowledge and experience, or by partners, one or more of whom is a technologist, are rapidly passing out of existence, and the need for considerable capital expenditure in premises, plant, etc., has, in consequence, involved the formation of the large and important statutory companies which are such a feature in the modern industrial world. It is due to these developments that the control of industrial enterprises has in this country passed mainly into the hands of men whose chief qualifications and experience are of a financial and commercial kind, and that the men with scientific and technical qualifications have to a considerable extent been relegated to subordinate positions. However, the recent merging of industrial undertakings for the purposes of technical rationalisation is compelling wider and more urgent interest in management problems. Questions affecting the status and functions of industrial scientists and technicians have thus been brought under review, and there is evidence that the need for increasing the efficiency of the works organisation is in consequence fully appreciated to-day in many industries.

14. The present tendency, therefore, is to recognise the fact that, with the specialisation of functions imposed by the new conditions which have come into existence in Industry during the past half century, the highest possible degree of collaboration is essential on the part of the various groups, technical and non-technical, of a staff organisation in order to ensure the commercial success of enterprises of great magnitude concerned with activities of a complex and complicated nature.

15. In this country the complaint in Industry is not that good technicians are scarce—indeed, it is admitted that it is relatively easy to obtain men who have good scientific and technical qualifications—but that it is often difficult to obtain such men possessed, at the same time, of commercial acumen.

16. It is frequently alleged, on the other hand, that men of administrative ability of the highest quality are rare, and that it is a matter of the utmost difficulty to obtain such men in sufficient numbers. This difficulty may be due to the fact that too narrow a field has in recent years been searched for the men required for the most important administrative positions. It is the type of man who, whilst having acquired highly technical knowledge, has at the same time retained a wide outlook and ability to approach problems from other than purely technical points of view, is most needed for important administrative positions where the work dealt with is largely scientific and technical. And in Industry it is becoming easier to-day for men with such qualifications to rise to the important positions for which by reason of their abilities they are fitted.

d. The needs of the present day.

17. That British Industry finds it increasingly difficult to maintain the supremacy in the world's trade which it has long enjoyed, and realises that its position is seriously menaced by foreign competition, are matters which for some time have been disturbing the minds of many occupying important financial and commercial positions in the country. Again, that the impression prevails in the taxpayers' minds not only that the management of our Government departments is most uneconomical, but also that inefficiency is tolerated to a marked degree in many of them, will be apparent to everyone who gives a thought to the subjects which are everyday topics wherever matters affecting the conduct of State affairs are discussed.

18. The questions arise, then, to what extent, if any, are the adverse and inefficient conditions which are supposed by some to prevail in Industry and the Public Service, attributable to the fact that the talents of the men of science and the technologist are not properly and fully utilised either in Industry or in the Public Service, and if there is a failure in this respect, whether it can be remedied, and if so, how?

19. It has to be recognised in the workshop, in the commercial manager's office, in the board-room, and even in the cabinet minister's sanctum, that the questions of policy which come up for decision are frequently of a character involving much knowledge of a scientific or technological character.

20. In order to obtain commercial success in Industry, the laws of economics in their relation to production require observance equally on the part of the workmen, the foreman, the works manager, the technician, the commercial manager and the capitalist. A need exists therefore for the closest co-operation between these several classes so that each of them may contribute its proper share of effort towards the solution of the problems associated with the formation of policies in Industry. To ensure that this shall be the case requires that an effective link should exist in every organisation between the workmen and the management, and the zone of separation between them should be as narrow as possible. The effective link between the workmen and the management can, it is suggested, be provided in industrial concerns by the technical staff and in no other way.

21. Again, in the case of the Public Service, the requirements in relation to the promotion of efficiency similarly affect all grades of the official hierarchy, and demand effective co-operation on the part of all of them in order to avoid a duplication of effort, and so to ensure economy

in the force employed. This is a matter which largely depends on a proper subdivision of duties, and on the suitability of the staff organisation for the particular kind of work to be undertaken in such an organisation. An effective link should also exist between the Minister and those in the most subordinate grades. The nature of this link must necessarily vary according to the character of the activities of each particular State department; where the activities are very largely of a scientific or technical order, the effective link between the subordinate grades and the Minister can most effectively be provided, it is suggested, by the officers of the professional group.

e. The groups in an organisation and their several responsibilities.

22. The erroneous assumption which is sometimes made that the activities and problems of industrial undertakings and Government departments fall into two distinctly separable groups—the administrative and the technical—and that those engaged on the technical side, as a rule, possess neither the knowledge nor the capacity to deal with administrative problems efficiently, has already been referred to. Many of those who advance these views use the terms administration and administrative inappropriately not only to cover the work which, strictly speaking, is administrative in character, but also to include the functions of those responsible for the directive work of a business or Government department; they ignore, or are ignorant of, the fact that the activities of all business concerns and Government departments have three main aspects, viz.: (1) the directive aspect, or that of determining the policies; (2) the administrative aspect, or that of collecting and examining the data necessary for formulating questions of policy and to assist those at the head of a business or Government department to come to a decision thereon, and, when such decisions have been arrived at, of issuing the necessary instructions and of making all relevant arrangements in connection with the carrying out of the measures and works involved in giving effect to such decisions; (3) the executive aspect, or that of actually putting into force or executing the measures and works authorised by such decisions. In some continental countries this grouping of the main aspects of the work of a Government department is definitely recognised, and in Italy these groups are referred to respectively as (a) the directive organ; (b) the administrative organ, and (c) the executive organ.

23. It will be obvious that although the directive aspect of the work of a business or Government department is separable from the administrative and technical aspects—whether it is desirable or not to separate them is another question—the administrative and technical aspects are clearly so interwoven that they cannot be, and in practice are not, entirely separated; consequently in Industry and in the Public Service men of science and technologists must—and actually

do—deal with a great volume of administrative work, the term being used in its proper and restricted sense, and much of it is of an important character. It is in relation to the directive aspects of the work of business and Government departments that the value of the special knowledge and practical experience of the man of science and of the technologist has not been fully appreciated; in Industry they have in the past been allowed only in relatively rare cases to establish themselves in the branch of a business organisation responsible for this aspect of the work, and in the case of the Public Service they have been almost entirely excluded.

f. Main types of administration.

24. Efficiency and economy, whether in Industry or in the Public Service, depend to a very considerable extent on the type of administration and the type of organisation that may have been adopted in each particular instance. Consequently, the distinctive features of the various types of administration and of organisation require to be closely examined by those in responsible positions, in order that the suitability or otherwise of one type or of another for some particular activity may be ascertained. The general principles of organisation have been stated in outline with great clearness in a pamphlet prepared by the officials of an important American corporation which has given considerable attention to the subject; and extracts setting out these principles will be found in Appendix II. The special features of the main types of administration and of organisation are discussed in a number of publications (mainly foreign); summarised statements based on the information contained in these publications have been prepared, and will be found in the following paragraphs

25. There are two distinct main types of administration considered in relation to the management or ruling element—sometimes referred to as the directive organ—in every organisation. In one of these types, the whole power and authority, and the control of a business undertaking or Ministry, is vested in and exercised *nominally* by a single individual with undivided responsibility; whereas in the other the power, authority and control are vested in and exercised by a group of individuals who act together with a joint and several responsibility, according to the nature of the matters dealt with and the character of the action required in relation thereto.

26. Both these types of administration have existed side by side for many decades in many countries. On the continent of Europe the first of the above-mentioned types is known as the Bureau System, an expression used synonymously with autocratic government of the old Prussian type; whilst the latter type is referred to as the Collegial System. Familiar examples in this country of the former type are the privately owned businesses managed by their proprietors, or by their agent, and certain Government departments; examples of the

latter type are the incorporated companies managed by boards of directors, the local government services managed by municipal and county councillors, the Board of Admiralty, the Army Council and the Air Council.

27. Although the collegial system of administration has been in vogue, in the case of the municipal services, from time immemorial, and, with the incorporation of businesses of all kinds under statutory provisions, has been universally adopted for the management of industrial undertakings, it does not find favour with, nor has it been given a fair trial in, the realm of our Central Government dealing with the Civil Service. This system has been condemned in the Fourth Report of the Commission on the Civil Service (Cd. 7338. Vide Chap. IX, paras. 68, 69 and 72): it is alleged that it is less effective in securing responsibility for official action and advice than the system followed in departments where full responsibility is definitely laid upon the Minister. A number of "phantom" boards (for example, Trade, Agriculture, Works and Buildings, and Education) continue, even at the present day, to be appointed, as a matter of form, in this country, nominally to manage the affairs of certain departments; they are a relic of the old Committees of the Privy Council. However, in none of these cases is the department actually administered by a board to-day.

28. Experience, however, exists to prove that this system can be successfully adopted in the Public Service. The Board of Admiralty, which has been in existence practically since the office of Lord High Admiral was put into commission, continues, to the present day, to administer the affairs of the Navy in a manner giving reasonable satisfaction to the public. In theory, at all events, the general policy of the Board is based on the advice of the Sea Lords, who are naval officers on the active list of the Royal Navy and constitute the expert element, as well as that of the Civil Lords, and the Financial and Permanent Secretaries, who constitute the lay element on the Board. Further, it will be remembered that the administration of the War Office was subjected to very serious criticism after the South African War, and the adoption of the Board system, on the model of that of the Admiralty, was publicly demanded. After an enquiry into the subject, the Government of the day was, in 1904, induced to create the Army Council, and it took over the administration of the War Office. In this case, the expert element consists of the Military Members who are military officers on the active list of the Army, whilst the Secretary of State for War and the Civil Members constitute the lay element. Again, when the Air Ministry was formed in 1918 it was endowed with a constitution modelled on that of the Board of Admiralty and the Army Council. The Air Council consists, in addition to the President and Vice-President, of four Members, three of whom are officers of the Royal Air Force on the active list, and constitute the expert element on the military side, whilst the fourth is a civil servant, who is responsible for the administrative side. In the case of each of the Defence Departments, the expert members, in addition to their joint and several responsibilities in respect of the directive aspects of the work of the Admiralty, War Office, and Air Council, are also responsible, in an individual capacity, for the administration of particular groups of services.

g. Main types of organisation.

29. A matter which is of equal importance to the type of administration and its constitution, so far as it affects the proper utilisation of the knowledge and experience of the man of science and the technologist, is that of the type of staff organisation which should exist in Industry and in the Public Service. Probably in no two cases are the conditions so similar that an identical arrangement of staff can be provided for throughout the various industries and in all Government departments; obviously in each industrial undertaking and in every Government department special requirements must exist in relation to the grouping of the staff, since the objects and results intended to be achieved differ. Naturally, with differing purposes, the factors which go to settle organisation have varying importance, and consequently, while it is possible so to frame organisations that their general design is based on the same model, nevertheless there will be differences in the detail, and it is with this reservation that the following suggestions are made.

30. Until very recently, the organisation finding most favour in business undertakings and Government departments was one based upon one-man control on the original military model. It had not been re-designed from time to time, as had been its prototype, to keep pace with changing conditions, and had in consequence become antiquated. As the conditions in the economic sphere began to change, and undertakings such as the railways, telegraphs and telephones, and those concerned with the supply of gas and electrical energy, expanded, this type of organisation became unsuitable for them, owing to the fact that the developments which these enterprises brought in their train differ in a two-fold respect from the majority of those which preceded them. In many cases, the operations and processes carried on assumed a complex technical character and had, at the same time, to be conducted over and in a wide extent of territory. It became, in consequence, necessary to establish sometimes, in these cases, branch offices, and to divide the territory in which they operated into districts, and to locate a staff at out-stations in order that various duties in connection with these services could be carried out more expeditiously and economically than would be the case if the whole staff were centralised in some one place. By a process which it is not necessary to follow out here, modifications were introduced in the old type of organisation, and in the economic sphere there exist to-day two main types of organisation—namely, (1) the old type known as the Territorial Organisation, and still sometimes referred to as the Military Type; (2) the new type known as the Functional Organisation.

31. The difference between these two types consists essentially in the character of what have been termed the units of organisation. In the case of the territorial organisation, the district or area which, in relation to the particular kind of activity concerned a single individual is supposed to be capable of administering efficiently, is chosen as the unit. An official placed in charge of such a district or area is made responsible for all the services which have to be provided, or the works which have to be carried out therein, regardless of their diversity or complexity. In the case of the functional organisation the units are determined solely in relation to the distinctive functional character of the several groups of services or works which make up the activities as a whole of a particular undertaking or concern; e.g., in the case of an engineering undertaking the essential units may consist of at least three services, each of a distinctive character; (a) the financial or administrative group, (b) the commercial group, and (c) the engineering group. In the functional organisation each of the units is, in the interests of efficiency, treated as a separate group, and the individuals placed in charge of and made responsible for the services or work of each unit are chosen by reason of their specialised knowledge in relation to, and their aptitude qualifying them to deal with, the essential function which predominates in the services or work for which the group is made responsible. In the functional organisation the heads of groups stand on an equal footing, and, when necessary, act jointly as a Committee.

32. These two main types of organisation possess distinguishing features which bear a resemblance to the characteristics which create the distinction between the two main types of administration mentioned earlier. The territorial organisation resembles the bureau type of administration; each of them is an example of the control by a single individual who is nominally responsible for the technical as well as the commercial or administrative work. The functional organisation resembles that particular application of the collegial type of administration—often met with in the United States of America—in which technically qualified men are found on a Council or Board of Directors, who whilst acting jointly in relation to matters of policy, i.e., in relation to the directive aspect of the business, also administer individually a technical branch in relation to which they possess specialised knowledge and experience; in each of these instances there is group control based on a correct sub-division of duties and responsibilities.

33. It is claimed that the functional type of organisation possesses advantages over the territorial type: some of the features on which this claim is based are set out in Appendix III. The former type is, it has been asserted, more scientific in its arrangement of the staff than is the territorial organisation, and it permits the scientific and technical staff to be utilised in the most advantageous manner. The further merit is claimed for it of reducing to a minimum the possibility of friction between the various branches.

34. Although it is evident that questions affecting organisation have been receiving increased attention here and there, it is unfortunately the case that no systematic study of the subject on a comprehensive scale has yet been undertaken in this country. However, the governing bodies of some of our professional institutions fully recognise how important it is that technicians should possess an adequate knowledge of administrative and economic subjects, and, in a few cases, such subjects have been included in the syllabus of the professional examination for those seeking membership.

II. THE LOCAL GOVERNMENT SERVICE.

a. The distinctive feature of its administrative system.

35. The Royal Commission on Local Government appointed on February 14th, 1923, under the Chairmanship of Lord Onslow, has, as stated earlier, recently taken evidence from a number of the specialised vocational associations (see Appendix I), which have lately come into being in this branch of the Public Service. In this evidence a comprehensive account is given of the practice and procedure, as it exists to-day, of County Councils and other Local Authorities. Advantage has been taken of this fact, and a short summary is given below of the salient matters dealt with by the witnesses, representing the various vocational associations which, although they have been formed mainly with a view to the protection of the interests of their members, appeared also to be keenly alive to the desirability of keeping a watchful eye on matters affecting the purity and efficiency of the services carried out under the jurisdiction of the several Local Authorities; their aims and objects are, that is to say, to elevate the status and procure the advancement of the interests of their members, and at the same time to ensure that only persons possessing proper qualifications shall be appointed to fill vacancies in the responsible professional and technical positions under these authorities.

36. The distinctive feature of the organisation adopted in this country for carrying on the local government services consists in the arrangement whereby the responsibility for the supervision and control of the administrative details involved in the execution of the policies sanctioned and adopted by County Councils and the various Municipal Authorities is vested in a number of separate committees each dealing with some particular service. The designation of the officers and the distribution of duties between them vary in different districts. For convenience, the duties are regarded as falling into two distinct groups; namely, that in which the administrative aspect of the work predominates—e.g., the general and legal, finance, health, education and police—and that in which the technical aspects of the work are of paramount importance—e.g., general engineering, water, gas, electrical and tramway undertakings.

37. In carrying out the administrative work in relation to the services for which each is responsible, the several committees in question are directly assisted by the chief officers, who act as technical advisers and also supervise the work of one or other of the departments.

38. Necessarily these chief officers are as a rule drawn from the professional classes and are persons who have had a good technical or professional education and have practical experience in relation to the work of the department placed under their control. Working as they do immediately under the appropriate committees responsible for the schemes prepared by them, these chief officers are not subject to any bureaucratic control. The town clerk—who is generally a member of the legal profession—is, by an almost immemorial custom, recognised as the principal officer of the local authority; he is *primus inter pares* and, apart from the particular duties of his own department, co-ordinates the various services of the council, in order to prevent overlapping and to prevent a course being taken by one department without consideration for its effect on another department. It is recognised, however, that it would be most improper for a town clerk to criticise or interfere with a technical officer in the carrying out of the technical duties assigned to him; that is to say, the technical officers under the Local Authorities severally exercise their functions independently of the town clerk.

b. Status of the professional officers.

39. The important status accorded to the technical or professional expert in the Local Government Service is due, it has been explained, to the historical development of local government: most of the duties originally assigned to the Local Authorities were of a technical character, and it seemed only natural to the lay bodies responsible for the management of municipal affairs that technicians should be placed in charge of the departments formed to deal with such services; questions affecting policy were alone retained in the hands of the elected representatives of the ratepayers. This system was found to work well and efficiently, and has consequently been retained up to the present time. The existence of a number of separate and independent departments would appear at first sight to be responsible for some measure of waste, and for creating friction between the several chief officers. However, in the evidence given before the 1923 Royal Commission on Local Government, it has been definitely stated that the organisation works smoothly in practice and there is not the slightest friction between the heads of departments in the actual working. This is due, no doubt, to the fact that their work (which is directly supervised by Committees) is co-ordinated by the Councils responsible for the local public services.

40. The evidence which has been given before the Royal Commission on Local Government, appointed in 1923, indicates that the special knowledge and practical experience of the scientific and technical officers has long been appreciated. It is also obvious that the present

system of administration adopted for the conduct of the municipal and the local government services is admirably adapted for the purpose and admits of, and generally speaking results in, the fullest and most effective use being made of the scientific and technical staffs employed under the various Local Authorities. It ought not, perhaps, to be a matter for surprise that a desire should exist on the part of some to see changes effected in relation to the administration of the local government services. In a few cases the witnesses who have appeared on behalf of vocational associations (see Appendix I) before the Royal Commission on Local Government have advanced the claim that the branch of the municipal service which they represented should be considered a separate and independent department, and that its head should rank as a chief officer; for example, it has been suggested that the sanitary inspector should invariably be regarded as an officer directly responsible to his authority and in this respect be co-equal with the other chief officers instead of being, as is sometimes the case now, a subordinate official under the Medical Officer of Health. But on the whole these witnesses appeared to be satisfied with the present conditions of service and the status of the groups represented by them.

41. But proposals were put forward by other witnesses which, if adopted, would bring about a fundamental change in the constitutional fabric of municipal government; one witness advocated the appointment of a chief officer in all municipalities, corresponding to the burgomaster who is supreme in relation to municipal affairs in certain continental cities. Another suggestion of the same kind (made by a different witness) was that a person possessing the authority and responsibility of the city manager, usually an engineer, who is now in charge of the municipal affairs in many American cities, should be appointed. The first of these proposals involves the vesting and management of the local government services in skilled administrators of the Civil Service type, and the second the transfer to a technician of the present responsibilities of the clerks to Local Authorities. In a further suggestion submitted to the Commission, it was advocated that interchanges of duties on the part of Civil Servants and Local Government Officers by temporary transfers of staff from Government departments, particularly the Ministry of Health, to the offices of Local Authorities and *vice versa*, should be arranged. None of these proposals received much support from Local Government Officers; the views of the latter on these proposals were that, if they were adopted, economy and efficiency of the local government services would be adversely affected, and at the same time the status of the chief officers employed in the Local Government Service would be lowered.

42. So far as the services under Municipal Authorities and County Councils are concerned, the special knowledge and training of the scientific and technical staffs appear on the whole to be properly utilised. The directive and administrative structures, which have stood the

trial of many decades, are both suitably designed to secure the highest degree of efficiency and economy in the local government services. There may be minor directions in which improvements could with advantage be effected, but radical alterations such as those which have been advocated by some of the witnesses appearing before the Royal Commission on Local Government, in the type of administration or in the staff organisation in vogue at the present time for the purposes of the management and execution of the local government services, are to be strongly deprecated: innovations which would transform the structure of municipal government in order that it should possess a close resemblance to the model of a civil department of the Central Government would, we are of opinion, prove injurious to the interests of the rate-paying public.

III. THE CIVIL SERVICE.

a. Historical development.

43. The ordinary civil administration of England was carried on during the XVIIIth century by the Ministers of the Crown themselves, with the help of Parliamentary Boards and a few personally appointed clerks. But the great industrial revolution of the early years of the XIXth century introduced new problems into the governmental sphere and involved the consideration of so many matters of a complex kind that it became necessary to introduce into the central administration a class of permanent government officials, and from this change has developed the present-day Civil Service organisation. At the time when these reforms in organisation were first inaugurated, the problems to be dealt with in Government departments were still of a kind in which the administrative aspect very largely predominated; and, probably also because systematic courses of instruction in scientific and technical subjects had not yet been introduced into our leading educational establishments, it was not unnatural that men without technical knowledge and experience were appointed to the permanent staffs of the Ministers of the Crown.

44. Nearly six decades ago the patronage system of recruiting the Civil Service was almost completely abolished; the method of recruitment by competitive examination was then extended to those required for the duties of the superior non-technical grades. At that period, the obligations of the State in relation to the complex problems of an industrialised community already covered a wide field and the State had then also recently entered upon its responsibility as the undertaker of an important technical enterprise, the telegraphs; however, the work of Government departments continued still to be mainly administrative in character. In these circumstances, the number of men with scientific training and technical experience required in superior positions in the Public Service—outside the Fighting and Medical

Services—was strictly limited; in consequence, the competitive examination system did not, at the time, apply to the technical staffs in the Civil Service. But even at that period, it was recognised that men with a superior standard of qualifications were required for the more important positions on the non-technical side of the Civil Service; steps were accordingly taken to provide a career in the Higher or First Division (now the Administrative Class) which should prove attractive to the graduates of our universities; and, at one time, a career on the administrative side was practically the exclusive privilege of those who had entered the Civil Service by the Higher or First Division Open Competitive Examinations.

45. Since the termination of the Great War, the administrative and clerical branches of the Civil Service have been completely reorganised on the lines of the Report of the Joint Committee of the Civil Service National Whitley Council, issued in February 1920; and in connection with this re-organisation a new structure for the various grades of the administrative and clerical classes has been introduced. An improvement in the salary scales has, in some cases, taken place—and provision has been made for opening the Administrative Class "to all men and women already in the Service who show early proof of real ability and promise of being able to discharge, in course of time, higher administrative functions." However, as "experience has shown that the higher administrative work of the Public Service requires, for its discharge, a proportion of men recruited at the university leaving age," the Administrative Class is to be recruited, in the future, only partly by selection from inside the Service, and a proportion of the vacancies will still be filled by "men selected for appointment to the Public Service by means of an open competitive examination in the subjects embraced by the various honours courses of University institutions." Furthermore, the Asquith Committee reported, in definite terms, in 1920 that the onerous and responsible duties falling on the permanent administrative heads of the principal departments of the State had become much more burdensome during the last two or three decades, and in recognition of this fact the salaries of these officials were raised, in July 1920, to £3,000 per annum, this comprising, in the majority of cases, an increase of 50 per cent. on the pre-War scales.

46. The character of the problems handled in the several Government departments naturally varies very widely. However, in all cases a very large proportion of the matters handled in these departments can no longer be treated as simple administrative questions. The transformations which have been taking place in the activities of Government departments have, naturally, been in the nature of a gradual evolution. Therefore when the necessity for information of a specialised technical kind first made itself felt in the central administration, the needs of the moment were met by the introduction into the staffs of Government departments of professional men, who acted

purely in a consultative and advisory capacity. The expert class in the Government Service was, in consequence, originally recruited alone from among men of mature age possessing considerable practical experience, as well as theoretical knowledge, in matters pertaining to their profession or calling. The case may be illustrated as follows. The Secondary Branch of the Board of Education affords a salient example both of this recruitment and of the differentiation of responsibility, as between administrative and education officers, when the latter have been appointed for their technical knowledge. This separation of function was gradually evolved. In 1904 the Board appointed, in addition to local Inspectors, a Chief Inspector and 4 Staff Inspectors stationed at Whitehall, whose age on appointment, it is interesting to note, ranged from 36 to 48 years. For six years the administrative staff settled all questions, educational as well as administrative, consulting Inspectors or not as they saw fit. In 1910, however, by Office Memorandum the Secretary of the Board made a radical change in procedure by setting up for the Branch an Advisory Committee which consisted of Inspectors together with the Director of Special Inquiries, and to it stood referred all educational, as distinct from administrative, matters arising both out of Inspections and otherwise. To complete this differentiation of function, Reports on the Full Inspection of Schools, after scrutiny by the administrative staff, were issued to School authorities as Reports not of the Board but of the Inspectors. It was the intention of the Secretary to apply this differentiation in turn to the Elementary and Technological Branches, but fate decided otherwise; before this happened, he was transferred to organise another Department of State. The principle, however, whose efficient and successful working has not since been challenged, remains as an example of good and successful organisation where technical knowledge is given due authority in its own field.

b. The modern need for specialised knowledge and consequent increase in the State service in the numbers of officials of the expert groups.

47. With the passage of time, administration became dependent to an increasing extent on factors of a technical nature and, necessarily, these had to be subjected to investigation at the hands of experts possessing appropriate specialised knowledge. The field of specialised knowledge associated with governmental work therefore became wider, and consequently necessitated an augmentation in the consultative and advisory staffs of the expert class; and further, the scope of their duties had to be enlarged also. In many cases, it was no longer sufficient that a member of the expert staff should simply tender advice based on personal knowledge of scientific and technical matters for the guidance of a Minister of the Crown, but it also became necessary, in several classes of problems involving scientific and technical considerations, for the expert to examine and work out intricate details, and subsequently to supervise the detailed administration in the execution of schemes—which sometimes necessitated the expenditure of very large sums of public money—if and when sanctioned. In these circumstances, the expert in a Government department often ceased to occupy the position merely of an adviser, but had to be provided with a staff of professional or technical assistants, and came in consequence to occupy the positions of consultant or adviser, technical chief of a specialised department, and also executive head of a large, highly trained staff, who dealt with the outside public (contractors, engineers, etc.) in regard to most important matters involving, as is indicated above, the expenditure of large sums of money and the necessary inspection and control of the work done under their responsibility.

48. In recent years, further developments have taken place, and to-day very large numbers of scientists are engaged on research duties in the Department of Scientific and Industrial Research, the Government Chemist's Department, the research and experimental branches of the Defence Departments, and the Ministry of Agriculture and Fisheries and the corresponding Scottish Departments. Further particulars relating to the status and duties of the officers of this group are given in a subsequent part of this report.

49. The altered conditions referred to above have resulted, in recent years, in a considerable increase in the numbers of established officers of the expert class—i.e., those included in the professional, scientific, and technical grades in the Civil Service. A large proportion of these officers naturally occupy junior positions. The increase in this class between the years 1914 and 1924 was, approximately, 36 per cent, and the Estimates still shew an upward trend in their numbers. At the same time, a higher standard of professional knowledge has been called for, and to meet the situation, although a small proportion of men of mature age belonging to the professional classes are still appointed directly to important positions in the Civil Service by selection, the majority of the officers of the scientific and technical grades now either enter the service by open competitive examinations, or are selected for promotion from among those inside the service who are engaged on technical duties and are deemed to possess the necessary qualifications.

50. The practice of the Civil Service in relation to the conduct of the work of the Government departments differs widely from that of the Local Government authorities, briefly described earlier in this report. In many branches of the Civil Service the technical chiefs occupy a relatively unimportant position in the organisation of a Government department, and as a result are subordinate not merely to the secretary or permanent administrative head, but also to his department. Although, in theory, they are the advisers of the Minister in charge of the Ministry of which their departments form part, in practice they are mainly utilised for the purpose of providing technical information and advice to the secretary's department.

c. The practice and methods of Government Departments.

51. The affairs of State are conducted on a highly centralised system, which entails a considerable volume of correspondence between the secretary's department and the technical and other departments of the same Ministry; the volume of this correspondence is, in some Ministries, so great that the permanent administrative chief can deal with only a small fraction of it and, consequently, the major part of it passes into the hands of various grades of administrative and clerical officers in the secretary's department, who prepare a summarised minute thereon for the information of the Minister. In other words, in the normal course of events unless the expert has the privilege of direct access to the Minister by virtue of special circumstances, such as personal acquaintance, all his plans, ideas and activities in connection with matters coming within his purview are subject to filtration and interpretation by an officer or officers who must, in the nature of things, be less competent to appreciate their significance. Not only is this practice detrimental to the status of professional, scientific and technical officers, but also it deprives the supreme departmental authority of direct contact with the technical expert upon whose advice his decision should depend, and often results in providing him only with a layman's interpretation of the technical expert's advice.

52. Where, in the Civil Service, the practice in vogue for dealing with technical matters is normally as described above, obviously it is open to grave criticism. Such methods are unsatisfactory, as a Minister must, in some important cases, act on information not obtained by him personally at first hand; and, further, they are productive of an unnecessary duplication of effort, and consequently are uneconomical. The methods which are here condemned can alone be pursued by administrative officers who have failed to recognise the fact that the complex and complicated public services of modern times can only be effectively and efficiently carried on where there is a proper sub-division, not only of duties, but also of the responsibilities connected therewith, between an appropriate number of chiefs, administrative and technical, each absolutely accountable for the aspect of the work under his immediate jurisdiction, and each possessing an equal authority in respect of his own sphere of activity. In many cases, the work of a Ministry covers so vast a field that no single individual, whether of the administrative or of the technical group, can be found who is endowed with either physical strength or intellectual capacity sufficient to enable him to familiarise himself with every detail and to acquire the specialised knowledge necessary to deal adequately with every aspect of the more important problems that have to be considered. An effective method of meeting this situation is dealt with in a later part of this report.

d. The Civil Service staff organisation.

53. There is, further, a serious defect in the Civil Service staff

organisation. Although, in many departments, the decisions which have to be given should be based on considerable technical knowledge, it has been the practice to exclude officers of the expert class from the important administrative posts responsible for the directive aspects of the work, and, except when men are appointed to them from outside the Service, such posts are filled by promotion from the ranks of the administrative and clerical classes. The difference between the treatment meted out in this respect to administrative and clerical officers in the national Civil Service and that meted out to the officers of these two classes in the Local Government Service is, indeed, so marked that some of the members of the 1923 Royal Commission on Local Government put questions to some of the witnesses with a view to eliciting the reasons why, in the latter service, it is those with technical qualifications who hold the positions of chief officers, and why it is considered that there is no field in it for the person without technical qualifications—the skilled administrator—although, in the case of the Civil Service, the former type of official "did not get to the top of it," whereas the latter did so *invariably*.

54. The explanation offered by witnesses to the Royal Commission probably accounts correctly for this difference in the treatment of the two types, the administrative and the technical, in the two services. They pointed out that whereas the earliest tasks entrusted to a municipal corporation were, as stated in an earlier part of this report, of a character which required technicians to be at their head, on the other hand, the responsibilities of Government departments in the earliest times involved a consideration of problems in which the administrative aspect very largely predominated. Some of these witnesses also explained that there had always been a wide difference in the methods adopted by the Local Authorities and the State departments. Municipal councillors had from the earliest days of the existence of municipal government been accustomed to do the administrative work of the Local Authorities as a board, relying directly on their officers for technical advice in relation to the work for which the latter were immediately responsible. When County Councils were created, although their functions and powers were often of a character corresponding in importance and extent with the duties of some Government departments, they elected to adopt the practice of the older municipal bodies in preference to that in vogue in State departments. Ministers of the Crown, on the other hand, were, it was pointed out, formerly able to do, and personally did, a great deal of the administrative work of their departments individually. However, with the increasing complexity in the problems to be dealt with, new methods of handling the work have had to be introduced, but the administrative aspects thereof have continued to exercise a paramount influence in the framing of the staff organisation of Government departments. In the case of the Central Government the reforms introduced have, it has been asserted, been largely in the nature of duplicating the Ministers by lifelong, wholetime administrative officers.

55. Owing to the circumstances connected with the original character of the duties of the Central Government, officers of the Administrative Class continue to dominate the whole situation in the State departments. It is, therefore, not surprising that in the evidence given before the 1923 Royal Commission on Local Government strong adverse criticisms should have been made regarding the narrow rules of the Service, which, as a matter of practice, prevent an officer on the technical side, however well fitted or qualified he may be for the position, from being promoted to the higher administrative posts. In view of the fact that administrative ability of the first rank is uncommon, the policy that prevails in the Civil Service in relation to this matter has been characterised as being "inexpedient, short-sighted and unjust." Although no purely administrative officer can, except in rare circumstances, be included in the technical or scientific staffs, on the other hand, the work of many technical and scientific officers is partly administrative in character, and, in the interests of national and industrial efficiency, it is essential that a technical or scientific officer possessing proved administrative ability should not be excluded from the administrative side of the staff organisation.

e. The development of Civil Research under the State.

56. A descriptive account of the origin, development, and present organisation of the scientific, research, and experimental activities of the State is to be found in the Report of the Research Co-ordination Sub-Committee of the Committee of Civil Research (London, H.M. Stationery Office: 1928, 2s. 6d.). This account is complete and accurate except that it does not deal at all with the exceptional activities of the older professional departments of the Admiralty (the Haslar Experimental Establishment under the Director of Naval Construction and the Admiralty Engineering Laboratory at West Drayton which serves both the Engineer-in-Chief of the Fleet and the Director of Electrical Engineering), and does not give any description of the peculiar organisation of the Joint Directorate of Scientific Research and Technical Development of the Air Ministry.

57. The activities in question are classified in three main divisions: industrial, medical, agricultural. Research and experimental activities conducted by the three Defence Departments are classified under the heading "industrial." The medical activities are, apart from limited contributions from the medical branches of the fighting forces, conducted entirely by the Medical Research Council, which is maintained by a grant-in-aid and is not in the ordinary sense of the term a Government department. The agricultural activities are the exclusive province of the Ministry of Agriculture and Fisheries and the corresponding Scottish departments, with the exception of the botanical investigations undertaken at the Royal Botanic Garden, Edinburgh (which is under the Office of Works), and the research

work for which the Forestry Commission is responsible. Elements of complication, however, are introduced by the functioning of the Development Commission and the Empire Marketing Board. Of the three main groups the industrial is undoubtedly the most varied in scope and the most complicated in organisation. The activities of the Empire Marketing Board touch it at certain points, but it is mainly concentrated in the Department of Scientific and Industrial Research, in numerous sub-departments of the three Defence Departments, and in the Government Chemist's Department. The comments which follow will be confined to points in which the present organisation of industrial activities appears to be defective. (Such Institutions as the Museums and the Imperial Institute fall rather outside the broad classification here adopted.)

58. The first general comment on the scientific, research, and experimental activities here classified as industrial is that if monetary reward is to be taken as a yard-stick, the contribution which the scientists can make to the needs of the community is regarded as of very little account; for there is not a single scientist in the Public Service, apart from the Administrative Head of the Department of Scientific and Industrial Research, who is paid on a higher scale than £1,200-£1,500 plus bonus, i.e., £1,390-£1,673 inclusive. The salaries of the general body of scientific workers employed in the Civil Service are equally out of scale with those enjoyed by the administrators, and are even inferior to the present inadequate level of the older professional staffs such as naval constructors, engineers, architects, and lawyers.

59. The present organisation of the Department of Scientific and Industrial Research is regarded as reasonably satisfactory. The same may almost be said of the Scientific Research and Experiment Department of the Admiralty. In this case, however, the investigative staff is divided into scientific and technical pools on the basis of differentiation between research work at the initial stage and development work at a later date of a problem; such a differentiation is not always simple in application, but no serious difficulties have yet arisen, mainly because both types of activity are under a single control.

f. Research under the Air Ministry and the War Office.

60. The scientific, research and experimental activities of the Air Ministry are mainly conducted through what is known as the Joint Directorate of Scientific Research and Technical Development. The Joint Directorate has two heads, both of whom are directly responsible to the Air Member for Supply and Research. The Director of Technical Development and the Director of Scientific Research each has a deputy. Below the rank of Deputy Director the staff is organised differently according to its location. At headquarters there are four Assistant Directors and two independent branches. The Assistant Directors and the heads of the branches are responsible to both Directors: under them

are two Superintendents—Superintendent of Scientific Research and Superintendent of Technical Development—each of whom is responsible to his appropriate Director. At the Aeroplane and Armament Experimental Establishment and at the Marine Aircraft Experimental Establishment the senior civilian again is responsible to both Directors. At the Air Ministry Laboratory the whole of the work is of a research character and the officer-in-charge is responsible to the Director of Scientific Research alone. The staff of the Joint Directorate is similarly divided into two groups; one is labelled Scientific Officers (who are normally pensionable under the Federated Universities Superannuation Scheme) and the other is labelled Technical Officers (75 per cent. of whom are pensionable under the Civil Service Superannuation Acts). The two groups, however, are officially regarded as interchangeable by way either of promotion or of transfer, although the manner in which promotions and transfers from one Directorate to the other have been carried out has not always been regarded as satisfactory.

61. The present organisation with its dual control and dual responsibilities works by no means smoothly. Cases are alleged to arise in which particular pieces of work that are clearly of one character are improperly appropriated by the other Directorate or its officers, and other cases arise in which a particular piece of work is debited to the wrong branch of the Joint Directorate simply in order to meet accounting requirements. The inherent difficulties of dual control tend to be increased by the fact that the post of Director of Technical Development is earmarked for, and that of Deputy Director is invariably filled by, serving Royal Air Force Officers who occupy them only for limited periods (not more than three years and frequently less).

62. Again, any post in the Joint Directorate may be blocked by a serving Royal Air Force Officer and such appointments are frequently made. The defects of this practice are commented on in paragraph 90 of the evidence of the Institution of Professional Civil Servants to the Carpenter Committee, which is as follows:—

> "When such officers are possessed of adequate qualifications, "the main argument against the practice is its costliness, both "absolutely and also because such officers normally remain only "for limited periods and the frequent changes destroy continuity. "The best solution here would seem to be to release the serving "officer who is at heart a scientist or technician at an early stage "so that he may enter the civilian staff at a relatively low point in "the scale. When on the other hand the serving officers blocking "civilian posts are inadequately qualified, the practice works for "evil in two ways: the civilian staff has one efficient worker the "less, and the unqualified serving officer creates additional work "by his very lack of knowledge."

63. The interpolation of serving Royal Air Force Officers in the civilian hierarchy of the Joint Directorate is no doubt intended to

ensure *liaison* between the Royal Air Force and the civilian staffs engaged on research and experimental work for its benefit. The importance of maintaining such *liaison* cannot be overstressed; the subject is dealt with in later paragraphs of this report (see the Section of the report relating to "The Defence Departments").

64. The problem of *liaison* having been suitably provided for, there remains the problem of finding the best alternative to the present unsatisfactory organisation of the Joint Directorates of Scientific Research and Technical Development. The fundamental defect is division of control and division of responsibilities over a field through which no clear and definite line of demarcation can be drawn. The problem is difficult and complicated, and only tentative suggestions can be put forward at the present stage. One possible development would be to lay down a stricter definition of scientific research, confining it to long-period investigations in fundamental problems, and widening the field of technical development so as to include all short-period investigations undertaken with the object of meeting the immediate needs of the Royal Air Force. A second possibility would be to reverse the decision of the Air Council taken in April 1924, when the former single Directorate was split into the present Joint Directorates. A third possibility would be to interpolate a co-ordinating post (preferably to be filled by an appropriately qualified civilian officer) between the twin heads of the present Joint Directorate and the Air Member for Supply and Research, the holder of the new post to be responsible directly to the Air Member for Supply and Research for all the activities of the Joint Directorate, and other associated services.

65. It has been explained in the earlier paragraphs that in the Admiralty and also, apart from the earmarking of certain controlling posts of serving officers, in the Air Ministry, the responsibility for the general administration and control of scientific, research, and experimental work is assigned to appropriately qualified civilian officers. In practically all the Research and Experimental Establishments controlled by the War Office, however, there is interposed between the highest civilian scientific or technical officers and the relevant member of the Army Council a military officer or officers, holding their appointments for comparatively short periods, whose duties are mainly administrative but also partly technical. This arrangement divorces the responsibility for the general administration and control of scientific and experimental work from those who are immediately concerned in its performance, and by depriving the civilian experts of the status which their colleagues in other Departments enjoy tends to diminish the effectiveness of their contribution to decisions upon policy in which scientific and technical considerations are of the first importance. The grouping of scientific research and experimental work for the Army under a civilian officer or officers directly responsible within their respective spheres to the appropriate member of the Army Council is

considered to be justified by the success which this method of organisation has given elsewhere.

g. Need for inquiry into matters affecting the status and functions of officials of the professional groups.

66. During the past few years members of the scientific and technical staffs of the Government departments have been endeavouring to persuade His Majesty's Government to institute an exhaustive inquiry into matters affecting their status and functions. The necessity for the modernisation of the organisation and the procedure of Government departments is not a matter which rests merely on the views of the vocational associations which have been, and are still, advocating the cause of the professional and technical groups in the Public Service; it is also strikingly apparent in the reports issued during the last few decades by a number of parliamentary and other official committees, which have been appointed from time to time to investigate certain matters connected with some of the governmental activities, and, further, by the public speeches and writings of ex-Ministers, and others occupying prominent positions. These reports and speeches have in recent years made the public familiar with some of the unsatisfactory features alleged to exist in connection with governmental enterprises of a technical nature.

67. H.M. Government has recently been induced to take steps to have the situation affecting certain aspects of the Public Service investigated. Shortly before the General Election of 1929 Mr. Baldwin appointed a Committee to inquire into matters affecting the functions and organisations of certain establishments in the Government Service and the conditions of service of the civilian scientific and technical officers employed therein. A few weeks later, Mr. Ramsay MacDonald, on becoming Prime Minister, set up a Royal Commission to inquire into the structure and organisation of the Civil Service and other matters relating to the same: this Royal Commission had not, at the date of the preparation of this report, completed its task.

68. It is our view, reached after due consideration of the available evidence, that some of the administrators who control the civil departments of the Public Service are unable satisfactorily to adapt themselves to the changed conditions which have come into existence in the Public Service not only by reason of the increasing dependence of Industry upon governmental action, and the services run by it, but also by reason of the growing intervention of the State in the social life of the people.

69. The methods of administration and the organisation of Government departments are such that the scientific and technical experts instead of occupying positions giving them direct access to the Ministers are, as a rule, subordinates of the permanent head of the department. Further, their position is sometimes made most difficult as they are

subject not only to the control of a single administrator, but also to that of administrative and clerical officers of the secretariat over which the permanent head presides. In certain departments the procedure adopted, as stated in an earlier part of this report, results in a considerable volume of unnecessary correspondence between the technical and administrative branches in relation to technical schemes and proposals. This procedure sometimes leads to the usurpation by non-technical officers of the proper functions of the professional and technical groups. On the face of it, such methods of conducting business cannot, and in fact do not, conduce to the attainment of either economy, harmony or efficiency.

h. The desirability of simplifying the grading of officers of the professional groups.

70. The argument is sometimes advanced that in the case of Government departments the work of the administrative group is of a character superior to that of the professional group, and indeed that the values of the two groups are in no way comparable. The contention has also been advanced that owing to the great diversity of the duties which fall to the professional group of the Civil Service and the fact that it is made up of more than five hundred grades, it is not possible to devise a suitable classification scheme for the Civil Service as a whole. This plea, however, has now lost much of its force owing to the fact that an Act has been passed in the United States which provides for the classification of the civilian positions within the district of Columbia and the field services (American Classification Act of 1923—Public—No. 516—67th Congress H.R. 8928). Under this statute the "compensation schedules," that is, salary scales, are grouped under five services, namely: (1) the professional and scientific service; (2) the sub-professional service; (3) the clerical, administrative and fiscal service; (4) the custodial service, and (5) the clerical-mechanical service. The number of grades in the several services naturally varies, but a distinctive feature of the Act is that in the case of the two most important groups, namely, the professional and scientific service, and the clerical, administrative and fiscal service, the salaries in the topmost grades in each of them are identical. It is recognised, moreover, that in each of these services certain grades represent positions of equivalent responsibility, which is in each case clearly set out, and they accordingly carry salary scales with identical minima and maxima (vide Appendix IV). It should further be noted that in this Act the professional and scientific service occupies the position of first importance.

71. A simplification of the grading of the professional, scientific and technical staffs in the Civil Service is a matter which, in our opinion, demands urgent attention. The subject is one which has recently been examined by a Royal Commission in Canada, and is dealt with

in the Report of the (Canadian) Royal Commission on Technical and Professional Services, February 1930. In this Report it is stated (at p. 16):—

> "We have studied in detail the present system of classification "in the technical, scientific and professional service, and are "impressed by the fact that it is unnecessarily cumbrous. The "number of *individual* classifications is very great; and the techni- "cal, scientific and professional workers are paid at present on no "less than two hundred and three (203) distinct and separate salary "scales. . . ."
>
> "We regard it as essential to the more efficient administration "of the Service that a limited number of salary scales should be "substituted for the present multiplicity. . . ."

The Canadian Commissioners have recommended that the number of grades in the Canadian Technical and Professional Civil Service should be reduced from two hundred and three to seven.

72. The present structure of the professional, scientific and technical groups in the State service of this country resembles that of the similar groups in the Canadian Civil Service condemned by the Royal Commission mentioned in the preceding paragraph, a simplification of its grading on the lines indicated in the Report of the (Canadian) Royal Commission would, in this country, also be of material advantage from an administrative standpoint. Incidentally, too, a reconstruction in the form of a graded technical service would tend to remove, to some extent, the great disparity which exists between the careers offered in the Home Civil Service to the scientific and technical groups and those open to the administrative and clerical groups. (Not only is promotion very much less rapid in the former than in the latter group, but the salary scales also are markedly inferior, so that the undertaking of specialist duties of a technical character in the Civil Service results financially in the penalising of the expert officers). In a perfect staff organisation, the two groups, the administrative and the technical, should be visualised as consisting of two parallel streams of equal importance, and with equal progress as regards status and promotion, but they should not inexorably be excluded from confluence; indeed, the merging of the scientific and administrative streams should be provided for in the directive zone in State departments, as well as in Industry.

73. The evidence which has been obtained by us shews that, as a general rule, the position of the scientific and technical staffs in the Home Civil Service is most unsatisfactory, and that, in the interests of efficient administration and national development, drastic reforms are needed in the organisation of many of the civil departments of the Government. In order that the scientific and technical staffs should exercise their function properly it is imperative that the position occupied by the Minister of a civil department should be altered to accord

with present-day requirements; and, further, that the responsibilities of the scientific and technical staffs in relation to the Minister should be clearly and specifically prescribed. The heads of the scientific and technical departments should, it is submitted, be colleagues of, and be equal in status with, the permanent heads of departments, and not subordinates under a secretariat or similar body.

i. Modernisation of the administrative system of the Civil Service now necessary.

74. What is required in the Civil Service at the present time is a type of administration almost identical with that adopted in an up-to-date business concern, so that the Minister may occupy the proper position in his department as the effective head of a directive group of administrative, financial and technical officers; each group being responsible for its own views and free from control by other groups; that is to say, in State departments the collegial system of administration should as far as possible replace the existing bureau system. The Minister would then act as the co-ordinating influence, in the case of incompatibility between the views of the various groups. There is evidence that the collegial type of administration can, under modern conditions, be satisfactorily introduced in State departments. In a letter published in *The Times* of October 3rd, 1929, Mr. F. Kellaway, formerly Postmaster-General, states that when at the Post Office he established a Board consisting of the principal officers under him; this arrangement appears to have worked efficiently throughout the period during which it remained in existence (vide Appendix V).

75. It seems desirable that a course should now be taken with the civil departments similar to that adopted in relation to the old War Office after the South African War; an investigation into the requirements of each of them individually by a strong independent Committee should be carried out, so that each of them may be endowed with a constitution to meet present-day requirements. The remodelled organisation of these departments would naturally include a directive organ, resembling in its constitution that existing in the Defence Departments. The non-political members would obviously consist of the heads of the administrative and professional departments of the Ministry, who, whilst acting in an advisory capacity as members of the Council, would severally administer one or other of the departments of the Ministry. Were this done, the organisation of Government departments would take the most highly developed form of the functional type which has been already described.

76. The collegial or board type of administration was found to work whilst it existed in Scotland and has worked satisfactorily in the case of the Defence Departments—and in the case of the new War Office organisation has, it has been claimed, given better results than the bureaucratic type formerly in existence. There is every reason for

assuming that, in spite of the arguments advanced against the former type of administration in the Fourth Report of the Royal Commission on the Civil Service, to which reference has been already made, given goodwill it could be made to work successfully in the Civil Service and improved results should be obtained as has been the case at the War Office since the recommendations of the Esher Committee were adopted.

77. Were reforms to be carried out in the administration and organisation of the civil departments of government on the lines indicated above, it would no longer be necessary for the Minister to occupy the illogical position he often does to-day; a position in which tradition is wrongly supposed to impose upon him the duty of screening the defects of his department. The reforms indicated, if given effect to, would not impair, but on the contrary would enhance, the status of a Minister as a great officer of the Crown. He would then act in the capacity of an Inspector-General rather than of a General Manager, and his role, when complaints were made concerning his department, would properly be to investigate matters and apply the appropriate remedies where defects of administration or organisation were brought to light.

IV. THE DEFENCE DEPARTMENTS.

Complex character of their activities.

78. The organisation of Government departments and the domestic affairs of the Public Service often appear complex and confusing to the layman; more particularly is this the case with naval, military, and air-force matters, where the interlocking of naval, military, air-force and civilian staffs, and of the administrative and the technical sections is of an elaborate character. Not only are the three Defence Departments concerned with the direction of the armed forces of the Crown, but each of them is, at the same time, responsible for a number of educational establishments in which specialised instruction and training are provided; and, also, for much important research and experimental work of a scientific kind. The Admiralty, the War Office and the Air Ministry have also under their direct control and management important industrial undertakings connected respectively with the construction of ships, the manufacture of ordnance and ammunition, and the construction of balloons and airships. Further, the Air Ministry is responsible for matters affecting Civil Aviation, and, owing to its special importance in relation to aerial navigation, the control of the Meteorological Office is vested in a Director and Committee appointed by the Air Council.

79. The activities of these great departments of the State are many-sided, and their headquarters' organisations contain various sub-departments (all of which are not represented in the Fleet, and in the Army and Royal Air Force formations); further, large numbers of officials employed therein, on the non-technical and technical sides, are

civilians and governed by Civil Service Regulations (mention has been made of, and particulars have been given in relation to, the technical groups in an earlier part of this report). Again, under each of them there are a number of advisory committees, the membership of which includes, in addition to officers of the Fighting Services, a certain number of civilians, many of whom are distinguished men of science.

80. It has been represented to us that the arrangements which exist for the maintenance of close contact between the civilian staff engaged on scientific research and experimental branches and the Fighting Services is unsatisfactory, and militates against efficiency. It is suggested that the arrangements for *liaison* between the two should be reciprocal and should avoid detriment either to the civilian staff or to serving officers. With the notable and significant exception of the oldest professional branch of the Admiralty, the *liaison* has hitherto been sought solely by bringing representatives of the Fighting Services into more or less direct contact with the work of the civilian staffs; the latter thus obtain some indication of the particular difficulties and problems which the former can discern. Much, however, yet remains to be done to bring to light the many problems of the Fighting Services which science could solve.

81. Considerations such as those stated above suggest that *liaison* should be of a reciprocal character, and, in our opinion, it would best be obtained by the attachment of suitable members of the civilian staffs for reasonably long periods to various units of the Fighting Services, and suitable members of the Fighting Services to the appropriate scientific, research and experimental establishments. In neither case should a *liaison* officer block posts in the establishment to which he is attached, and in both cases he should remain eligible for promotion within his own service.

V. THE ROYAL NAVY.

a. Changes in the character of the personnel of the Fleet consequent on the mechanisation of warships.

82. The great revolution in naval war, so far as the type of ships normally used for the purpose is concerned, dates from the Russian War; the last action fought under sail was the attack of the "Arethusa" against the port of Odessa in 1854. After that date the mechanisation of the Fleet, so to speak, may be said to have begun. In due course the great advances in engineering science and modern inventions naturally had their effect on the design of fighting ships, their equipment and their armament, to such an extent that they are now engineering products from stem to stern, and are fitted in every part of them with machinery of a more or less complicated kind; a modern battleship has been aptly described as "an epitome of the application of scientific discovery and mechanical invention." The engine-room of a battleship

is to-day a super-power station; and in complexity a modern gun-room rivals the main engine-room. Needless to say, it requires officers with considerable scientific knowledge and practical mechanical and electrical experience to deal adequately with the machinery in them in a manner to secure and maintain the fighting efficiency of the Fleet.

83. It is natural that the great transformation in matters affecting the ships of the Fleet indicated above should also have introduced changes in the character of the personnel of the Navy. With the advance in the mechanisation of warships it became necessary for artificers and stokers gradually to displace sailors; in consequence, at the beginning of the present century, engine-room complements accounted for one-third of the men of the Navy and, during the Great War, the Engineer-in-Chief of the Fleet had under him a body of officers and men exceeding 80,000.

84. Three great technical departments are directly responsible at the Admiralty for the construction, repair, upkeep and running of the ships of the Fleet, viz., the Constructive Branch, the Engineering Branch, and the Electrical Branch—each of which is under a technical head. There are also other departments which deal with other technical matters—e.g., those of the Director of Naval Ordnance, Director of Torpedoes and Mining, and Director of Dockyards; the heads of these departments, however, are naval Executive Officers, and have under them professional technical assistants drawn from the Constructive, Engineering, and Electrical Branches.

85. The Constructive, Engineering and Electrical Branches also provide the technical staffs of our home and foreign dockyards, and it is on the professional knowledge, skill and zeal of the technical officers that the deck officers are largely dependent in their efforts to maintain a high standard of efficiency throughout the Fleet. The area and scope of this dependence tend to increase with the developments in the application of mechanical and electrical aids.

86. The officers of the Constructive and Electrical Branches are civilians and are governed by Civil Service Regulations; the officers of the Engineering Branch are naval officers and undertake duties in shore establishments or in ships.

b. Matters affecting the Engineering Branch.

87. Formerly, the officers of the Navy, exclusive of the Marines, were known respectively as the Military and Civil Branch. The Military Branch consisted of the deck officers—now the Executive Branch—whilst the Engineers, together with the Medical Officers and the Pay-masters, were included in the Civil Branch. This grouping of the officers, it is evident, was illogical; it militated to some extent against efficiency, and brought into existence difficulties relating to the status of the Engineers. Further, it gave birth to grievances, which have resulted in the submission of many petitions to Parliament and the issue of numerous pamphlets urging reform.

88. Amongst the earliest of the claims put forward on behalf of Naval Engineers was that they should be granted military status and all the rights and privileges which accompanied it. A Committee of Inquiry appointed in 1875 definitely recommended that Naval Engineers should be granted military status, but the conservative forces of the day were too strong, and this concession was withheld.

c. The status of the Naval Engineer.

89. An improved status for the Naval Engineers had to be reached by a slow process of evolution. The unsatisfactory conditions existing in that Branch had the very natural result of creating serious difficulties with regard to the recruitment of candidates of a suitable type and education. An attempt was made in 1902 to solve the problem by a system of common entry and training for the deck and engineering officers, known as the Fisher-Selborne Scheme. Under this Scheme new entrants performing engineering duties were included in the Military Branch, but the Engineer Officers recruited under the old system continued to be regarded as belonging to the Civil Branch. Finally, in January 1915, in recognition of the splendid services of the Engineer Officers and the engine-room ratings during the early days of the War, military status was conceded to the whole of the Engineering Branch.

90. Since then, however, feature after feature of the Fisher-Selborne Scheme has been obliterated, and now nothing remains of it but the condition of common entry and training until the cadet is rated midshipman, when specialisation takes place. By a Fleet Order of November 1925 a new organisation of the officers of the Navy was introduced, and it has had the effect of depriving Engineer Officers of real military rank, and, therefore, of the many privileges which that rank confers.

91. The continual changing of the conditions of service affecting the Engineers cannot fail to react unfavourably on the efficiency of the Fleet. The latest change in the policy of the Admiralty seems likely to destroy the spirit of unity and concord amongst the officers of the various branches of the Navy; there is also evidence that it has made entry to the Engineering Branch less attractive, in so far as there has been a considerable shrinkage in the number of young officers entering the Keyham Establishment from Dartmouth.

92. It would obviously be an act of presumption on the part of a Committee consisting largely of laymen to criticise the details of either the naval, military or air force organisation as a fighting machine; on the other hand, there are many matters relating to the general administration of the Fighting Services on which ordinary men of affairs, although they may not have had naval, military or air force training, are competent to express a sound opinion. Consequently, in view of the well-known fact that a controversy has for some time past raged in relation to the alleged inferior status of the Engineer Officers of the

Fleet, and also in relation to the alleged failure to employ them in spheres for which their education and training qualify them in an eminent degree, we have examined certain proposals (made by those qualified to deal with the subject) which have been put forward with the view of remedying some of the defects to which attention has been called; we venture to add some comments thereon.

93. It must be borne in mind that each of the sides of naval technique, namely, that relating to the science of naval war and the strategical and tactical methods of fighting, and that relating to the upkeep and maintenance of the engineering and mechanical appliances associated with the driving and fighting equipment of modern warships, requires special and deep study. It is fully admitted by all who have given serious consideration to the matter that normally it is not possible for an officer of ordinary ability to become expert in two of these branches of naval science and art. In these circumstances, it is evident that the complete fusion of the Executive and Engineer Branches of the Royal Navy is not practicable.

94. However, the essential requirements in the Royal Navy, as in the other Fighting Services, is that there shall be unity and community of sentiment throughout all branches of this great Service. Such a sentiment can to a great extent be brought into existence and fostered by administrative means. In the early days of the mechanisation of warships the grouping of the officers of the Royal Navy was, as has already been suggested, illogical. In order to remedy the defect in the Fleet organisation here referred to, the Engineer Officers put forward the not extravagant demand for the grant of executive titles, accompanied by all that this connotes. The conferment of executive authority and power on the Naval Engineer is mainly and essentially needed in order that the Engineers' duties may be efficiently performed and that the Engineering Branch may be placed in a position commensurate with its functions and the important responsibilities resting on it. The manner in which the claims of the Engineering Branch was dealt with in 1902 by the Admiralty and the vacillating policy which has been followed since that date can hardly fail to inspire the gravest doubts as to whether regard has been given to the best interests of the Naval Service. It seems to us only common-sense that men who hold such important positions in the Royal Navy as do the Engineer Officers should be invested with that status, power and authority which are needful to ensure that their duties shall be carried out in the most efficient manner, and that men with the highest qualifications shall be attracted in abundant numbers to the career open in the Engineering Branch of the premier Fighting Service.

d. Memorandum prepared by certain leading Professional Institutions in relation to questions affecting the Engineer Officers of the Royal Navy.

95. Questions affecting the status and functions of the Engineer

Officers of the Royal Navy have been carefully studied in recent years by a Joint Committee formed by the following professional bodies:—

The Institution of Civil Engineers.
,, ,, ,, Mechanical Engineers.
,, ,, ,, Naval Architects.
,, ,, ,, Electrical Engineers.
,, North East Coast Institution of Engineers and Shipbuilders.
,, Institute of Marine Engineers.

They have prepared a comprehensive memorandum dealing with the whole subject and have submitted a copy thereof to the First Lord of the Admiralty. A very brief summary of this memorandum was published in the issue of the "Engineer" for April 30th, 1926. The memorandum was also referred to by the late Duke of Northumberland in the House of Lords when he dealt with the case of the Naval Engineer in July 1926 (vide Parliamentary Debates (House of Lords), Vol. 64, col. 1062 *et seq*). The information contained in it has been utilised in the compilation of this section of the present report.

96. The Joint Committee mentioned above is of opinion that the development of our Naval Organisation on sound lines is being retarded by the refusal of the Admiralty to recognise frankly that engineering is of ever-growing importance in the Navy. It further urges that the situation can be adequately dealt with only by the adoption of a liberal policy providing for the placing of all machinery and engineering material under the control of those who have had the necessary fundamental engineering education and training, and for the granting to them of a status in every way equivalent to that enjoyed by the officers of the Executive Branch; specifically the Joint Committee considers it imperative that steps should be taken to give effect at an early date to the following recommendations:—

(a) The direct representation of the Engineer Department on the Board of Admiralty.
(b) Engineer officers to be fully eligible according to their rank for membership of Courts-martial.
(c) The control of all technical work to be vested in technical officers; and
(d) The higher shore appointments to be open to Engineer Officers.

97. We fully concur in the views expressed above, and are convinced that the adoption of the recommendations set out in the preceding paragraph is essential in order to secure the proper utilisation of the Engineer Officers of the Royal Navy; we further feel that reforms of the nature indicated would unquestionably secure increased efficiency in the Fleet. At the same time, the adoption of the above recommendations would tend, as a subsidiary effect, to remove all the irritating and illogical differences which create the idea, both inside and outside the Service, that the Engineering Branch occupies an inferior position

in the Royal Navy. Real military rank and status should be granted in express terms, and it should be made palpably evident that Engineer Officers are equal, rank for rank, with Executive Officers, subject to the proviso that the right to command ships and fleets is confined to those in the latter category. These reforms would, in our opinion, bring about a satisfactory and lasting settlement of the questions which have long been at issue and have interfered with the promotion of harmony, a factor which in all organisations plays so important a part in the attainment of a high degree of efficiency.

VI. THE ARMY.

a. The importance of the technical services recognised since very early times.

98. The need for a body of officers in the Army possessing technical knowledge has existed for many centuries now. Indeed, there have been Chief Engineers since the XIIIth century, and from the first their business was with strong places for defence, with siege works and with engines for attack, including guns. The growth of scientific developments gradually affected the armaments and equipment of the military forces, and also gave increased importance to the services of a scientific and technical kind. In due course, the necessity for specialisation became apparent, and, early in the XVIIIth century this involved the separation of the Engineer from the Artillery Officers; they were then formed into distinct branches, which were long known as the Scientific Corps. At a subsequent period, other services of a scientific and technical kind acquired considerable importance and had to be placed on a proper footing. In the second half of the XIXth century the Army Medical Service was reorganised; and eventually the Royal Army Medical Corps came into existence. Similarly the need for changes in relation to the commissariat and transport services made itself felt; these services were placed under a newly-created branch, which is now known as the Royal Army Service Corps.

99. More recently, the experience of the Great War demonstrated in a forcible way that, as the range of human knowledge and scientific achievement increases, the help that the man of science and the technologist can render to a Commander in the field becomes more powerful, and their knowledge and advice more valuable. At an early date after the outbreak of hostilities in 1914, it became evident that war to-day is dependent on the exploitation of the latest discoveries and inventions. In consequence, it was soon found necessary to increase the proportion of technical troops allotted to various formations; further, as the War progressed, entirely new services and new forms of attack, such as sound-ranging and chemical warfare, came into existence; these were entirely novel requirements in relation to military

operations, and in respect of them no provision had been made in our Army organisation in peace time.

b. Changes effected since the Crimean War in the Army Headquarters administrative system.

100. The experience of war and peace has dictated at intervals various modifications in minor matters of organisation; further, it has been found necessary during the past hundred years to introduce two very important changes in the Army administration. At one time, the control of the two Scientific Corps, the Artillery and the Engineers, as well as the responsibility for the provision of armaments, ammunition materials, and stores, was vested in the Board of Ordnance, presided over by the Master General of Ordnance, who was a politician directly responsible to Parliament and quite independent of the Commander in Chief, and even of the Secretary at War who administered the cavalry and infantry. A miniature counterpart of the Board, consisting of the Senior Artillery and Engineer officers with a civilian official called the "Storekeeper," existed in every garrison and formed a Committee known as "The Respective Officers," which had extensive powers and recognised the Board alone as its superior authority. These Committees reported to the Board without reference to their immediate military chiefs. This system was, as might be expected, a continual source of friction.

101. The dual administration of the Scientific Corps to which reference is made in the preceding paragraph proved equally unsatisfactory in war and in peace, and was abolished in 1855, after the Crimean War. From that time onwards, the Artillery and the Engineers were placed under the direct orders of the Commander-in-Chief, each being controlled by General Officers (belonging to their own arm of the service) holding important appointments on the Headquarters' Staff; at the same time, the fortification services and barrack construction and maintenance were placed under the Secretary of State for War.

102. The system of administration of the Army in vogue at the beginning of the current century was severely tested in connection with the despatch and maintenance in the field of the Expeditionary Force sent to South Africa for the Boer War (1899-1902); it was found defective and was subjected to strong criticism. In consequence, the Esher Committee was appointed by the Government; after due investigation, it drew up a new organisation for the Army, and, on its advice, the work at Army Headquarters was in 1903-4 re-grouped and distributed between four military officers and two Members of Parliament, who, under the presidency of the Secretary of State for War, then constituted the Army Council. Far-reaching changes were involved; the post of Commander-in-Chief was abolished, the Scientific Corps were completely incorporated in the Army, and their separate control by General Officers of their own arm of the Service ceased. Another important feature

of the new organisation was the creation of a General Staff, the work done by which proved to be of immense value when the world crisis arrived in 1914.

c. Effect of recent technical developments on Army organisation.

103. The technical developments and scientific advances during the War years, and during the period following the termination of hostilities, have naturally had their reactions on the military sphere. In consequence, modifications have been introduced in the pre-war Army organisation; new arms, such as the Royal Corps of Signals and the Royal Tank Corps, whose duties are very largely of a scientific and technical kind, have taken their places on the establishment as independent units, and there has been a re-distribution of duties; the latter changes particularly affect the responsibilities of the Royal Army Service Corps.

104. Further, at the present time, much attention is being paid to the replacement of horse-drawn vehicles by motor-vehicles, and the introduction of armoured fighting vehicles. In order to co-ordinate the work in progress in relation to these matters, a redistribution of the duties at Army Headquarters has been carried out. Matters relating to the design of all fighting and transport vehicles have been concentrated in the department presided over by the Master General of Ordnance, and the responsibility for the Engineer services, which were formerly under his jurisdiction, has been transferred to the department presided over by the Quartermaster-General. The tendency at the present time is for the Army to share in the growing mechanisation of modern life, and, in consequence, the services of the technical officer have acquired an increased importance therein; to-day, without him, the Army can neither move nor fight.

d. Matters affecting the technical services.

105. The dual system of administration of pre-Crimean days, to which reference is made earlier, whereby the Scientific Corps were separated under the Board of Ordnance from the Army, brought in its train certain disadvantages, since the officers of the Artillery and of the Engineers practically never held command in peace or in war under this system. It was only rarely, too, that they were employed on the Staff in peace-time. The incorporation of these Corps into the Army has removed the disability under which the officers belonging thereto suffered; in modern times, Artillery and Engineer officers have, in peace and in war, held the highest positions of command and on the staff with distinction and success.

106. Representations have been made to us in relation to reforms which, it is suggested, are needed in the existing Army organisation. Among other things, it has been proposed: (1) that at least two of the Military Members of the Army Council should be drawn from the technical

services; and (2) that if the head of a technical branch at the War Office is not a Member of the Council he should at least have the same status as at present accorded to the Director-General of the Medical Services, and be given direct access to the Chief of the General Staff and to the Secretary of State on technical questions. We find that hitherto the position of Master-General of Ordnance has, since the formation of the Army Council, invariably been held by an Artillery officer,* and that both Artillery and Engineer officers have held the position of Chief of the Imperial General Staff at Army Headquarters. During the past quarter of a century, on many occasions, the composition of the Army Council has been such that of the Military Members at least two have been former officers of the old Scientific Corps. Further, a large number of officers belonging to the several technical branches of the service now hold important positions in every Department under the Military Members of the Army Council. And recently to the Department under the Chief of the Imperial General Staff there have been added three officers belonging respectively to the Artillery, Engineers, and Tanks, whose duties are to advise the General Staff on questions connected with their arm of the service and to issue such orders as may be required to be issued to those arms by the General Staff. Accordingly, we are of opinion that it is not desirable that any hard and fast rule in relation to the composition of the Army Council should be laid down. We also feel that the adoption of the second suggestion mentioned above would not be likely to promote efficiency; indeed it might have a contrary effect.

107. As regards the utilisation of the technical services during the Great War, there is evidence that in certain instances there was a failure in various theatres of war on the part of commanders and their staffs to appreciate fully that they should maintain the very closest touch with those responsible for the technical services, and warn them *in time* in relation to the nature of the assistance required from them and their subordinates. Further, it has been asserted that an attempt was made to put the technical services in a subordinate position, and that, in consequence, a considerable loss to the country resulted. These matters, it would appear, have not been overlooked by the authorities; instructions and Army Orders have been issued since the close of hostilities wherein the responsibilities of the technical officers have been clearly defined, with the view of preventing, so far as it is possible to do so, lack of efficient and effective co-operation between all concerned in the future.

108. It has been further recognised that the staff organisation at

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* The name of the officer who is next to succeed to the appointment of Master General of Ordnance at the War Office, when it becomes vacant, was announced in the Press on October 31st, 1930: the officer in question began his career in the Royal Engineers and at that date was Director of Military Operations and Intelligence at Army Headquarters.

General Headquarters in France in 1914, which provided for only three principal staff officers—the Chief of the General Staff, the Adjutant-General, and the Quartermaster-General—was faulty. Experience has proved that it will become increasingly difficult for a Commander-in-Chief to deal personally with all the technical questions which are likely to arise in a theatre of operations, and that co-ordination is imperative. In order to achieve this co-ordination, it has been decided that in the future the Master General of Ordnance shall be represented in the field.

109. From the evidence collected by us it seems clear that the importance of the technical services is recognised in the Army, and subject to what has been said in paragraph 65 with regard to the general control of scientific research and experimental work on war material, it appears that military technical officers enjoy a high prestige, a factor which cannot fail to react favourably on their efficiency and that of their subordinates. Although the proportion of technical officers taken for the Staff might, under modern conditions, be greater than it is to-day, we accept the view placed before us that it could not, with advantage to the service, be much greater, since the right feeling between the Staff and the fighting units could not exist unless the majority of the staff officers were drawn from the Cavalry, Infantry, Tanks or Artillery.

VII. THE ROYAL AIR FORCE.

a. Constitution of the Air Council.

110. The Royal Air Force came into existence as a separate arm during the progress of the Great War, which created many new problems in relation to National Defence: it owed its birth to the amalgamation of the Royal Naval Air Service and the Royal Flying Corps. The new Air Ministry which became responsible for the administration of the air formations was first created in April, 1918, and placed under a Secretary for Air, who was appointed President of an Air Council. The other members of this Council are the Under Secretary of State for Air, who is its Vice-President, three Air Members, who are officers of the Air Force, and the Secretary, who is a Civil Servant; each of the four members last mentioned is in charge of a department responsible for the military aspects of aviation. A separate Directorate of Civil Aviation now also forms a part of the Air Ministry.

111. The Senior Air Member of Council is the Chief of the Air Staff. The Department for which he is responsible is sub-divided into Directorates which deal with matters affecting Operations and Intelligence, Organisation and Staff Duties, and Works and Buildings.

112. The principal control of technical work in relation to aviation is centred at the Headquarters of the Air Ministry in the Directorates of Scientific Research and Technical Development and Aeronautical

Inspection, which are under the Air Member for Supply and Research. As in the case of the Admiralty, a large number of the officers employed on scientific and technical work in the Air Ministry are civilians and come under Civil Service Regulations. Obviously a need exists for effective and efficient *liaison* between the two groups, the Air Force officers and the Civilian Staff; this problem has not, according to the evidence which has reached us, yet received adequate attention at the Air Ministry.

113. Matters affecting manning, training and Royal Air Force Medical Services come under the Air Member for Personnel. General administration lies in the province of the Department of the Secretary, in which Directorates exist also for dealing with Accounts, Contracts and Lands, and Meteorological Services. In the Department last mentioned the staff consists almost exclusively of Civil Servants.

b. Recruitment, training and organisation of the Officers of the Royal Air Force.

114. On account of the fact that the Air Force was created by the amalgamation of the flying formations which already existed in the Navy and the Army, practically all the important positions on the military side of the Headquarters' Staff of the Air Ministry are to-day held by officers who began their careers in the Royal Navy or in the Army, and later served with flying formations during the Great War. However, as in the case of the older Fighting Services, there is now direct entry into the Royal Air Force and the future officers are recruited by open competition; the successful candidates undergo specialised courses of instruction at the Air Force Cadet College at Cranwell. Also an Air Force Staff College has been established at Andover; advanced instruction for Air Force Officers is provided there on the same lines as that provided for naval and military officers at the similar institutions connected with the two older Services. The intention of the authorities, it will be apparent, is to develop the Air Force as a distinct and separate Fighting Service.

115. A distinctive feature of the military side of the Air Force organisation lies in the fact that all the officers of the Flying Branch, whatever the nature of their duties and of their qualifications in specialised subjects, are borne on a single list for promotion. Opportunities are afforded to young officers to become proficient in certain specialised duties and, for this purpose, departmental courses of instruction are provided, e.g., an Armament Course, a Specialist Engineering Course, a Specialist Navigation Course, a Specialist Photography Course, and a Specialist Signals Course. Further, officers possessing particular aptitude for specialist duties, after qualifying in the service examinations in the appropriate subjects, are selected to attend one or other of the following University courses: (a) Engineering; (b) Electrical Engineering and Wireless Telegraphy; and (c) Meteorology. This grouping of the officers on the military side in a single branch should

avoid difficulties in relation to the status of those engaged on the different specialist duties and thus prevent the danger of bringing into existence internal stresses, which might have prejudicial effects on the efficiency of the military side of our youngest Fighting Service.

c. Defects in the Air Force organisation.

116. It has been pointed out in an earlier paragraph that there is no officer in the Air Ministry holding a position corresponding to that of the Engineer-in-Chief of the Fleet at the Admiralty. We are of opinion that the absence in the organisation of the Air Ministry of an officer with the qualifications and duties similar to those of the Engineer-in-Chief of the Fleet is a distinct source of weakness, and must make the Ministry dependent, in relation to matters affecting the construction of aeroplanes and their engines, on those engaged in the industries connected with aeronautics to a greater extent than is desirable from the point of view of national efficiency.

117. Again, although short specialist engineering courses have recently been provided for them, the officers of the Air Force concerned with engineering duties are not, according to the evidence which has reached us, educated or trained as engineers, as are those responsible for engineering duties in the Navy and in the Army. Further, there are no engineers holding really responsible positions on the aeronautical side in the Air Ministry, as there are on the naval side at the Admiralty.

118. Two sets of personnel exist side by side in the Air Ministry, namely, the group belonging to the military side of the Air Force, and the group constituting the Civilian Establishments. The questions relating to the recruitment and organisation of these two sets of officers involve entirely different considerations. The breadth and depth of the technical knowledge of the Royal Air Force officers who have taken technical courses cannot, as a rule, owing to the character of their duties, be compared with the breadth and depth of the technical knowledge of civilian technical officers who spend the whole of their career on scientific and technical work. The Air Force specialist technical officer undoubtedly can, and does, make a contribution of a particular and limited kind towards the development of aviation, but the civilian technical expert must nevertheless remain indispensable to the Air Ministry. In these circumstances, in the interests of national efficiency, it is necessary, in our opinion, that questions affecting the status and promotion of the fighting personnel and of the civilian administrative and technical personnel should be definitely separated and treated independently of one another. Careers should be provided in the Service for these two groups. Officers belonging to each of these classes should be able to attain positions of co-equal importance and status in the Air Ministry in order that each class may contribute its special knowledge and experience to the fullest extent towards the development of the Air Arm as a thoroughly efficient Fighting Service.

VIII. INDUSTRY.

a. Status of the technical and scientific worker.

119. In preparing this section of this report we have, as already stated, had to rely to a large extent on the response to inquiries addressed to a number of persons engaged in a technical capacity in some of the most important industries.

120. The information supplied reveals an extreme diversity not only of the conditions and status of technical workers and research staffs, but of the conception in the minds of directors and chief officials of the place and functions of these staffs in the industrial organisation.

121. This is explained by the differences in the circumstances in which industrial enterprises have been founded and developed. A typical instance is that of an inventor starting a small works to manufacture his own products, and continuing to exercise the chief directive function when, after a long period, the business has expanded to the stage of the limited liability company. Such cases were common during the XIXth century. An outstanding example of an undertaking jointly controlled and administered by representatives of the technical and the commercial-financial branches of its staff is to be found in the concern on which the present unified chemical industry of Great Britain was partly based. In nearly all concerns within these categories those responsible for the technical side of the work have enjoyed a status at least equal to that of the administrative chiefs, subject to the possibility of a change of control, to be noted shortly, in later stages of development.

122. On the other hand, in industries where it has been possible for a person or group of persons predominantly interested in the financial side to purchase machines and equip factories or mines, the tendency has been to employ technical staffs to supervise the operation of the plant and to keep these staffs in a subordinate position, without any share in or responsibility for administration and policy. In many concerns this conception of the place of the technician in Industry has prevailed until the present time. In others there has been a recognition in varying degrees that if British Industry is to keep pace with the progress of the most alert competitors in fields where improvement in technical processes and the application of new scientific discoveries to production on a commercial scale become ever more important, the status of technical workers must be raised, and wider opportunities for the exercise of responsible functions must be created.

123. Still another development in a complex situation may be noted. Reference has been made to the fact that in undertakings established and directed by an inventor or scientific discoverer, either alone or in association with commercial and administrative colleagues, technical workers have for the most part enjoyed a status commensurate with their responsibilities. In what may be regarded as a transition

period in British Industry, before the ideas broadly implied by rationalisation began to take root, some undertakings of this kind were included in amalgamations promoted largely, if not entirely, for financial purposes. In these circumstances the tendency was for the central control of the unified concern to be exercised by directors chosen especially to represent financial interests. In these circumstances it was inevitable that immediate financial considerations should take precedence of technical requirements which could be provided for only when a long view of the most likely technical evolution was taken. When this long view is taken, however, the closest collaboration with the responsible technicians and heads of research departments is demanded, but in the new form of large-scale organisation the first tendency in some cases was to relegate to subordinate positions these particular departmental heads, who had occupied a much more responsible place in the separate undertakings before amalgamation. It would be outside the scope of our inquiry to attempt to estimate how far this subordination of technical chiefs has been responsible for the critical situation of a number of large-scale industrial combinations in recent years, and for the present need for technical re-equipment and reorganisation. It can hardly be doubted, however, that the contrast admittedly existing between the high *average* modernity of industrial plants in America, Germany, and France, and the number of relatively obsolete plants in this country, is attributable in no small degree to the fact that British technicians in many undertakings have been denied the opportunity to influence policy to the same extent as in the countries mentioned.

b. The practice of the newly established industries and its influence on the older ones.

124. A significant contrast is offered by the experience of recent years in the field of rapidly-developing new industries. Of these the electrical-equipment and other sections of engineering concerned with the production of modern machines; the new spheres of chemical expansion in the manufacture of synthetic products; motor-vehicle and aircraft production; and artificial silk (rayon), may be specially mentioned. As the successful development of these industries has depended primarily upon research and the application of the results of scientific and technical experiment to commercial practice, and as the manufacturing processes become increasingly complex, the co-operative action of controllers of policy, administrators, technical directors, and those responsible for initiation in research, has been essential for rapid progress.

125. The trend towards organisation along these lines is now perceptible throughout the older industries. Pressure of events is compelling a widespread change of outlook, particularly in the depressed staple industries in which the need for comprehensive reorganisation, mechanical re-equipment, and far-reaching changes in productive methods is most urgent.

126. The recent appointment of an eminent scientist to direct and co-ordinate all research for the London, Midland and Scottish Railway, with a status corresponding to that of the principal directing heads on the administrative side, is a significant indication of the new point of view. In a number of large-scale manufacturing concerns a bold adaptation to modern needs is seen in a complete revision of the directing machinery, the importance of which, from the point of view of those responsible for technical progress, can hardly be exaggerated. This is the outcome of a realisation that the question of the status of industrial scientists and technical men cannot be evaded when changes take place which have the effect of increasing the complexity of the organisation, and call for unremitting attention to research and the swift application of beneficial scientific and mechanical developments to particular undertakings.

c. Some of the features of the new methods of control and management.

127. In the concerns where the new method has been applied, control and management are adapted to modern needs by a specialisation of functions, combined with machinery for the highest possible degree of collaboration between all concerned in the formulation of policy, the administration of the works, the direction of research, and technological progress in productive processes.

128. In this type of organisation the Board of Directors becomes a body of persons selected by reason of the possession of particular qualifications, so that collectively they combine the knowledge of finance, general organisation, administrative problems, and the trend of scientific and technical developments requisite for wise and far-seeing decisions on general policy. The responsibility for actual administration and works management in accordance with the general policy is delegated to an Executive Board composed of the heads of the chief departments, with the chairman and managing director linking up the two bodies by dual membership.

129. The importance of this development, in relation to our inquiry, lies in the fact that the technical officers and director of research are given a definite status on an equality with management and other officials in the task of carrying on the undertaking, apart from the possibility that they may have a direct representative on the Board of Directors. Constant consultation and collaboration are ensured. It becomes difficult, if not impossible, for policy decisions to be taken without due weight being given to considerations advanced by the technical chiefs.

130. Moreover, in an undertaking so organised, a technical official who is interested in the problems and tasks of administration finds an opportunity to develop this interest, and to make a contribution to the general direction of the undertaking which may be specially valuable

by reason of his technical knowledge and experience. The system obviously enlarges the sphere for the discovery of the type of man, so much needed at the head of large enterprises, who combines knowledge of the technical affairs of the business with a natural flair for organisation and administration. Clearly the supremely successful managing director of a modern large-scale productive undertaking is one who possesses, in addition to the qualities necessary for direction and control, technical, or technical and scientific, knowledge and experience sufficient to give him a broad grasp of the work of the whole concern. A technical officer with aptitude for those wider functions is more likely to find an avenue to promotion to this office in the co-operative tasks of the Executive Board than in the older form of organisation, in which too often he has been regarded as a subordinate person and excluded from either consultation or participation in administrative tasks.

131. In smaller concerns the circumstances may not favour the full development of an organisation of the kind described, but it is possible nevertheless to adapt the principle in greater or less degree. This has been done with marked success in some establishments which have been able to meet severe and growing competition only by maintaining constant technical progress. In a self-contained factory, for instance, where it is desirable that the managing director himself shall be in constant touch with all details both of the administration and mechanical development, it has been found a convenient plan to associate the departmental heads and supervisors in a Management Committee, with the managing director as chairman. Here also the principal technical and research officials are given a responsible status and full opportunity to apply their special knowledge and aptitude to a common effort to promote the efficiency and success of the undertaking.

132. It is along these general lines, in our view, that the efficiency of industry in the new post-war conditions, as well as the much-needed improvement in the status of scientific and technical staffs, may be most rapidly and effectively achieved. The point has been stressed in the course of our inquiry that there are two types of technical men. One finds full satisfaction in purely technical work or research. The other has a natural aptitude for administration, which may either be denied scope for expression or may become highly developed if constant opportunity for its exercise is afforded. The method of organisation just noted provides the conditions in which both types are able to make their most valuable contribution to the efficiency of the concerns in which they are directly engaged, and also to the promotion of the wider interests of industry as a whole.

d. The scope of the training needed by technical men and industrial scientists.

133. This recent development has an important bearing on the question of the scope of the training of technical men and industrial scientists. Some advocate the inclusion in degree or diploma courses of subjects which will give the student knowledge of economic administration. Others urge that such knowledge, if acquired at this stage of training, can only be superficial and therefore of little value if there is to be the necessary concentration on the scientific and technical subjects. They suggest that post-graduate study should be devoted to the additional subjects.

134. The matter is obviously one to be settled by those concerned in the training of each particular industry. It appears likely, however, that the inducement to undertake such post-graduate study will be far more powerful when it is realised that the changes in industrial organisation and management are creating wider opportunities in the sphere of direction and control for scientific and technical men possessing the necessary qualifications.

IX. CONCLUSION.

135. The question of the functions of the scientific and technical staffs and its bearing on efficient administration and national development requires, it need hardly be pointed out, to be viewed also from a psychological standpoint, the one most appropriate for this particular purpose. Nothing conduces to waste and inefficiency in a great organisation to a greater extent than legitimate discontent on the part of a staff, and in modern times perhaps one of the most frequent causes of disaffection and unrest has its root in matters affecting status, which is often closely bound up with the functions assigned to particular groups of the staff. If the stupid and groundless views which prevail, to the effect that work of a scientific and technical kind is inferior to that of an administrative or commercial kind, were to be completely banished, and if instead thereof the fact were to be fully recognised and admitted that in modern business and governmental organisations the closest co-operation is required on the part of those responsible for the financial, administrative, commercial, scientific and technical aspects of the work therein, the most difficult problems of administration and organisation would easily be solved; the knowledge that all were agreed that efficiency in a complex organisation depends upon a contribution different in kind, if not in degree, from each group therein, would prove to be the readiest means of securing contentment among all classes of workers.

136. The question of the general standards of remuneration of the scientific and technical staffs in Industry and in the Public Services has not been discussed in this report; the matter does not fall strictly within our terms of reference. The question is undoubtedly an important one; however, apart from the fact that its investigation lies outside the scope of our enquiry, we feel that matters affecting standards of remuneration are intimately bound up with those affecting

the efficiency of management and organisation of business concerns and Government departments, and that if suitable types of administration and of organisation were adopted throughout our industries and Public Services, and an adequate proportion of the directive and important commercial and administrative posts were, in consequence, to be filled from the ranks of qualified professional and technical men, the solution of problems connected with standards of remuneration would present no great difficulty.

The members of the Committee desire to record their keen appreciation of the services rendered by Lt.-Colonel W. A. J. O'Meara, who acted as Honorary Secretary to the Committee throughout its proceedings.

APPENDIX I.

ROYAL COMMISSION ON LOCAL GOVERNMENT (appointed Feb. 14, 1923).

Evidence given on behalf of following Vocational Associations:—

Jan. 31, 1929:	Association of Local Government Financial Officers; Sanitary Inspectors' Association; Society of Clerks to Urban District Councils.
Feb. 1, 1929:	County Councils' Association; Association of Municipal Corporations.
Feb. 28, 1929:	Society of Town Clerks; Society of Clerks of the Peace of Counties; Union and Rural District Clerks' Associations; Society of Medical Officers of Health.
Mar. 1, 1929:	Institution of Municipal and County Engineers.

(*Referred to in paragraphs* 1 *and* 35).

APPENDIX II.

GENERAL PRINCIPLES OF ORGANISATION.

1. The work of every business undertaking or government department should be definitely and clearly divided into separate branches and again sub-divided into distinct groups according to the nature of the main and subsidiary classes of operations or processes involved in each branch or group.
2. The control of the different branches and groups should be expressly assigned to specific officers and a direct chain of command should be constituted in such a manner that there can be no conflict of authority; that is to say, every individual in the organisation should clearly know to whom, and for what work, he is responsible.
3. Real authority and responsibility should be created, so that each officer, whether in a superior or subordinate rank, should actually supervise the operations for which he is nominally responsible and the supervising officers should also have direct and individual control of the subordinates employed under them.
4. The choice of officers for the control of the various branches and groups should be determined by the specific nature of their experience and their peculiar aptitude for the duties assigned to them; that is to say, *an officer should supervise only work which he is competent to judge and concerning which he can make helpful constructive suggestions to his subordinates*.
5. The groups and sections into which the work is sub-divided for the purpose of supervision should be so arranged as to afford an easy means for ascertaining the costs of each class of work, on a unit basis, at the various stages thereof, so that comparisons of the unit costs at different periods and also in the several groups and sections doing similar work—and therefore the efficiencies of the processes and administrative methods—may easily be made clear.

6. The arrangement of the several duties as well as those connected with the filing of correspondence, drawings and plans, etc., should be such as to ensure that all routine work is carried out expeditiously and without duplication.

(*Referred to in paragraph* 24).

APPENDIX III.

Advantages Derived from the Functional Type of Organisation.

(a) Modern methods of production and service are based on the conception that specialised work is more economical than unspecialised work, *when the volume of work to be done is sufficient to keep officials and workmen continuously engaged for the entire period of their employment on specific specialised work*.

(b) Very few officials have either the mental ability or the necessary training and experience to be proficient in every branch of the work in the operating department of a complex industrial or commercial enterprise. Each class of work is an art in itself, and proficiency in any one class can be acquired only after many years of training and experience. It is always far easier to get individuals who are competent to supervise the work of a single branch than that of every branch of an enterprise. Moreover the type of man who has a *natural aptitude* for commercial work often differs radically from one who has a *natural bent* for technical or scientific work.

(c) The best method of determining and increasing efficiency is by comparison. Since one official is responsible under functional organisation for the whole of the work or service of a similar kind throughout the undertaking, he can insist upon uniformity of procedure and record throughout his jurisdiction. Comparison is thereby facilitated, and also the introduction into all districts of improvements in methods discovered in one district. Such is not the case under the territorial organisation in which many minds are always at play in relation to each branch of work.

(d) Standardisation of plant or uniformity of method are essential elements in the promotion of efficiency. Standard methods are much more easily introduced in the functional than in the territorial organisation.

(e) Emergencies of an abnormal nature are better dealt with in a functional than in a territorial organisation. There is greater elasticity in the former than in the latter organisation in the matter of shifting the workmen from district to district in order to meet the fluctuations in the volume of work.

(f) The strength of every undertaking is dependent on the quality of its responsible officials. In consequence, it is of the highest importance so to arrange an organisation that capable men may be easily discovered and properly promoted. The functional organisation lends itself much more readily to the achievement of this purpose than does the territorial type.

(*Referred to in paragraph* 33).

APPENDIX IV.

AMERICAN CLASSIFICATION ACT OF 1923.

(Public—No. 516—67th Congress).

(H.R. 8928).

Sec. 13 of the Act sets out the schedules of compensation, i.e., the salary scales, of the several services in the following order:—

(1) Professional and Scientific Service; (2) Sub-professional Service; (3) Clerical, Administrative, and Fiscal Service; (4) Custodial Service; and Clerical-Mechanical Service.

The duties and annual rates of compensation assigned to the several grades of the Professional and Scientific Service will be found below. For purposes of comparison, the grades of the Clerical, Administrative, and Fiscal Service which carry equivalent annual rates of Compensation have been set out in a parallel column.

PROFESSIONAL AND SCIENTIFIC SERVICE.	CLERICAL ADMINISTRATIVE AND FISCAL SERVICE.
The professional and scientific service shall include all classes of positions the duties of which are to perform routine, advisory, administrative, or research work which is based upon the established principles of a profession or science, and which requires professional, scientific, or technical training equivalent to that represented by graduation from a college or university of recognised standing.	The clerical, administrative, and fiscal service shall include all classes of positions the duties of which are to perform clerical, administrative, or accounting work, or any other work commonly associated with office, business, or fiscal administration. ....
Grade one, in this service, which may be referred to as the junior professional grade, shall include all classes of positions the duties of which are to perform, under supervision, simple and elementary work requiring professional, scientific, or technical training as herein specified, but little or no experience. The annual rates of compensation for positions in this grade shall be $1,860, $1,920, $2,000, $2,100, $2,200, $2,300, and $2,400.	Grade five, in this service, which may be referred to as the senior clerical grade, shall include all classes of positions the duties of which are to perform, under general supervision, difficult and responsible office work requiring considerable training and experience, the exercise of independent judgment or knowledge of a specialised subject matter or both, and a thorough knowledge of office procedure and practice, or to supervise a large stenographic section of any large section performing simple clerical operations or to supervise a small section engaged in difficult but routine office work. The annual rates of compensation for positions in this grade shall be $1,860, $1,920, $2,000, $2,100, $2,200, $2,300, and $2,400. .....
Grade two, in this service, which may be referred to as the assistant professional grade, shall include all positions the duties of which are to perform, under immediate or general supervision, individually or with a	Grade seven in this service, which may be referred to as the assistant administrative grade, shall include all classes of positions the duties of which are to perform, under supervision, responsible office work along special-

small number of subordinates, work requiring professional, scientific, or technical training as herein specified, previous experience, and, to a limited extent, the exercise of independent judgment.

The annual rates of compensation for positions in this grade shall be $2,400, $2,500, $2,600, $2,700, $2,800, $2,900, and $3,000.

Grade three, in this service, which may be referred to as the associate professional grade, shall include all classes of positions the duties of which are to perform, individually or with a small number of trained assistants, under general supervision but with considerable latitude for the exercise of independent judgment, responsible work requiring extended professional, scientific, or technical training and considerable previous experience.

The annual rates of compensation for positions in this grade shall be $3,000, $3,100, $3,200 $3,300, $3,400, $3,500, and $3,600.

Grade four, in this service, which may be referred to as the full professional grade, shall include all classes of positions the duties of which are to perform, under general administrative supervision, important specialised work requiring extended professional, scientific, or technical training and experience, the exercise of independent judgment, and the assumption of responsibility for results, or for the administration of a small scientific or technical organisation.

The annual rates of compensation for positions in this grade shall be $3,800, $4,000, $4,200, $4,400, $4,600, $4,800, and $5,000, unless a higher rate is specifically authorised by law.

ised and technical lines, requiring specialised training and experience and the exercise of independent judgment, or as chief clerk to supervise the general business operations of a small independent establishment or a minor bureau or division of an executive department, or to supervise a large or important office organisation engaged in difficult and specialised work.

The annual rates of compensation for positions in this grade shall be $2,400, $2,500, $2,600, $2,700, $2,800, $2,900, and $3,000.

.....

Grade nine, in this service, which may be referred to as the full administrative grade, shall include all classes of positions the duties of which are to perform, under general supervision, exceptionally difficult and responsible office work along specialised and technical lines, requiring considerable specialised training and experience and the exercise of independent judgment, or as chief clerk, to supervise the general business operations of a large independent establishment or a major bureau or division of an executive department, or to supervise a large or important office organisation engaged in work involving technical training on the part of the employees.

The annual rates of compensation for positions in this grade shall be $3,000, $3,100, $3,200, $3,300, $3,400, $3,500, and $3,600.

.....

Grade eleven, in this service, whicl may be referred to as the assistant chief administrative grade, shall include all classes of positions the duties of which are to perform the most difficult and responsible office work along specialised and technical lines, requiring extended training and experience, the exercise of independent judgment, and the assumption of responsibility for results, or to supervise the general business operations of an executive department, or to supervise a large and important office organisation engaged in work involving extended training and considerable experience on the part of the employees.

The annual rates of compensation for positions in this grade shall be $3,800, $4,000, $4,200, $4,400, $4,600, $4,800, and $5,000, unless a higher rate is specifically authorised by law.

Grade five, in this service, which may be referred to as the senior professional grade, shall include all classes of positions the duties of which are to act as assistant head of a large professional or scientific organisation, or to act as administrative head of a major subdivision of such an organisation, or to act as head of a small professional or scientific organisation, or to serve as consulting specialist, or independently to plan, organise, and conduct investigations in original research or development work in a professional, scientific, or technical field.

The annual rates of compensation for positions in this grade shall be $5,200, $5,400, $5,600, $5,800, and $6,000, unless a higher rate is specifically authorised by law.

Grade six, in this service, which may be referred to as the chief professional grade, shall include all classes of positions the duties of which are to act as the scientific and administrative head of a major professional or scientific bureau, or as professional consultant to a department head or a commission or board dealing with professional, scientific, or technical problems,

The annual rates of compensation for positions in this grade shall be $6,000, $6,500, $7,000, and $7,500, unless a higher rate is specifically authorised by law.

Grade seven, in this service, which may be referred to as the special professional grade, shall include all classes of positions the duties and requirements of which are more responsible and exacting than those described in grade six.

The annual rate of compensation for positions in this grade shall be $7,500, unless a higher rate is specifically authorised by law.

Grade twelve, in this service, which may be referred to as the chief administrative grade, shall include all classes of positions the duties of which are to supervise the design and installation of office systems, methods and procedures, or to be head of a small bureau in case professional or scientific training is not required, or to perform work of similar importance, difficulty, and responsibility.

The annual rates of compensation for positions in this grade shall be $5,200, $5,400, $5,600, $5,800, and $6,000, unless a higher rate is specifically authorised by law.

Grade thirteen, in this service, which may be referred to as the executive grade, shall include all classes of positions the duties of which are to supervise the design of systems of accounts for use by private corporations subject to regulation by the United States, or to act as the technical consultant to a department head or a commission or board in connection with technical or fiscal matters, or to act as chief of a large bureau or a bureau having important administrative or investigative functions in case professional or scientific training is not required, or to perform work of similar importance, difficulty, and responsibility.

The annual rates of compensation for positions in this grade shall be $6,000, $6,500, $7,000, and $7,500, unless a higher rate is specifically authorised by law.

Grade fourteen, in this service, which may be referred to as the special executive grade, shall include all classes of positions the duties and requirements of which are more responsible and exacting than those described in grade thirteen.

The annual rate of compensation for positions in this grade shall be $7,500, unless a higher rate is specifically authorised by law.

(*Referred to in paragraph 70*).

APPENDIX V.

From *The Times* of October 3rd, 1929.

Letter from the Rt. Hon. F. Kellaway, in reply to Lord Wolmer's article: "Post Office and Public." (Published in *The Times* of Sept. 30th and Oct. 1st and 2nd, 1929.)

"In the third of Lord Wolmer's illuminating articles, 'Post Office and Public,' the writer says: 'No such thing as a Board of Directors exists at the Post Office!' When I went to the Post Office as Postmaster-General in 1921, I was impressed with this defect in the Post Office organisation and I set up a Board of the heads of the principal departments —Mails, Telephones, Telegraphs and Engineering Staff, and Finance. The board met weekly. The Postmaster-General presided; the Secretary of the Post Office attended; minutes of the proceedings were kept and all decisions recorded. I found the Board an invaluable piece of machinery and more than one member of it told me he had not before been able to form an intelligent view of the Post Office business as a whole. If, as I gather from Lord Wolmer's article, this organisation has been scrapped since I left the Post Office, I would respectfully suggest to the Postmaster-General that he would find it an assistance to him in the discharge of his duties to the public and his responsibility to Parliament if such a Board were re-established."

(*Referred to in paragraph* 74).

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